THE PAPER INDUSTRY

JAN 18 1933

A MONTHLY EDUCATIONAL JOURNAL JUNE, 1933

1833 CENTENNIAL 1933

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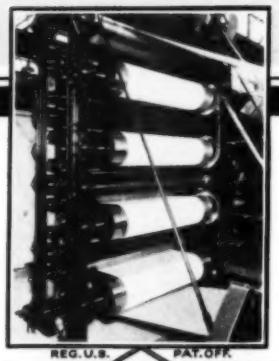

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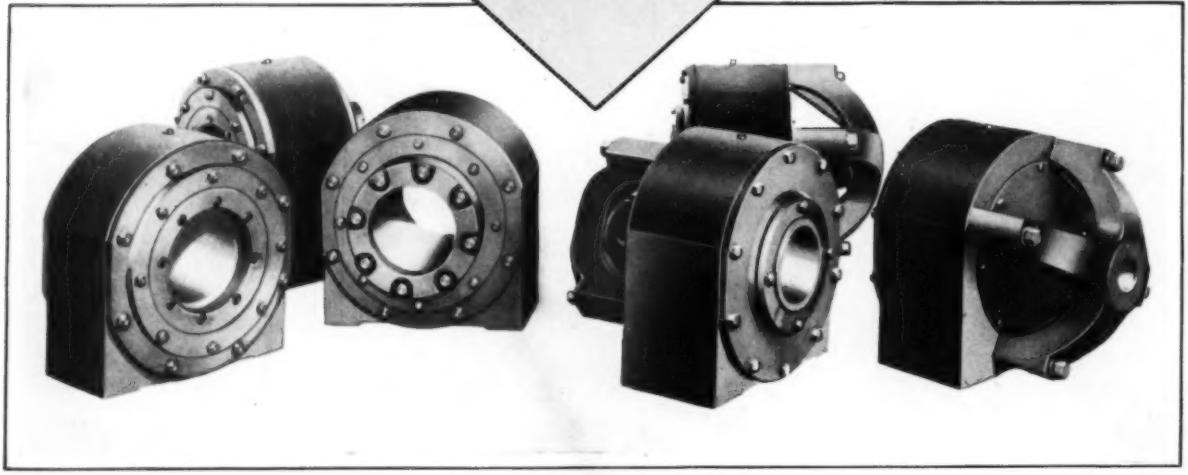

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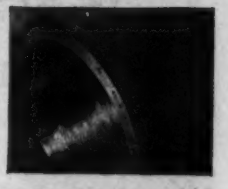

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THE PAPER INDUSTRY

JUNE, 1933
Vol. XV—No. 3

A MONTHLY EDUCATIONAL JOURNAL
Devoted to the Interests of the Pulp and Paper Industry

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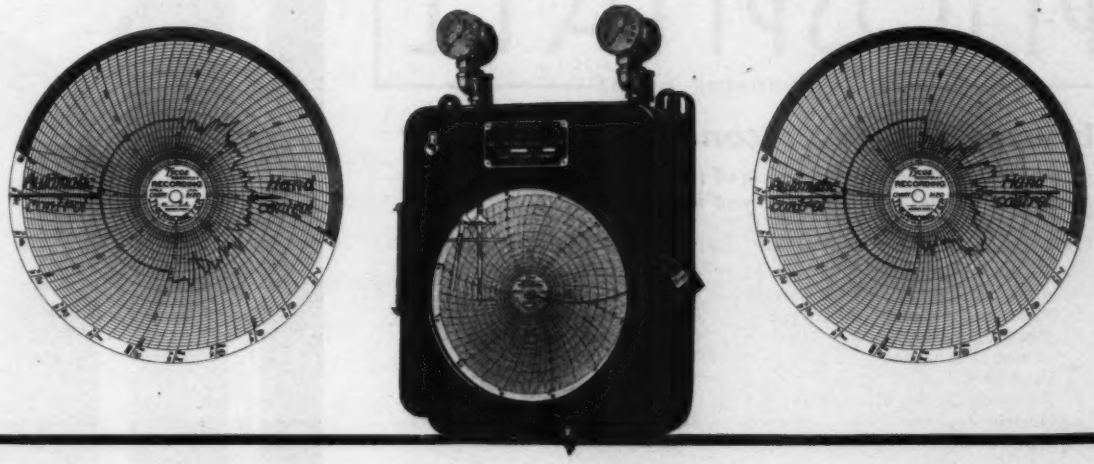

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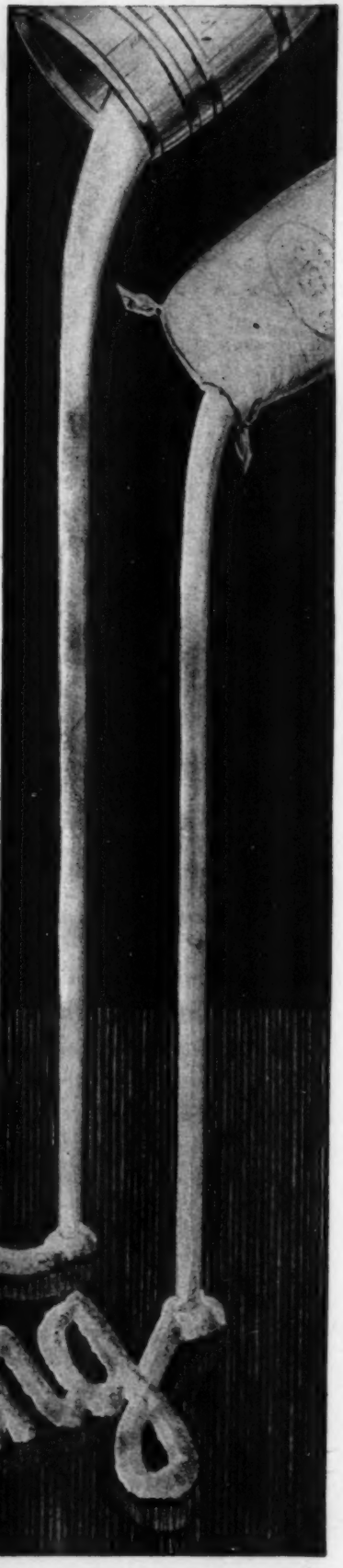

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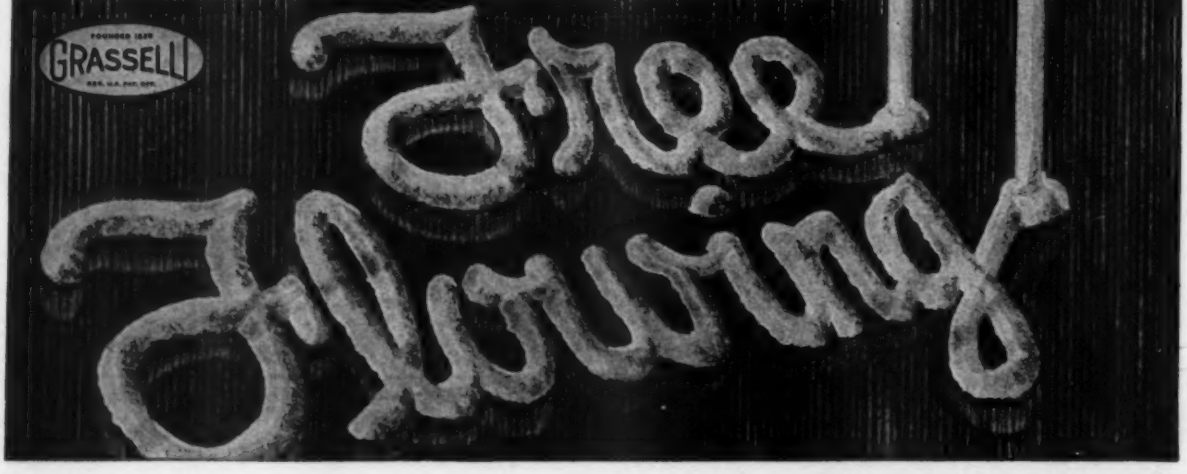

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AND so far as Aloxite Brand Pulp Grinding Wheels are concerned the speaker is absolutely right.

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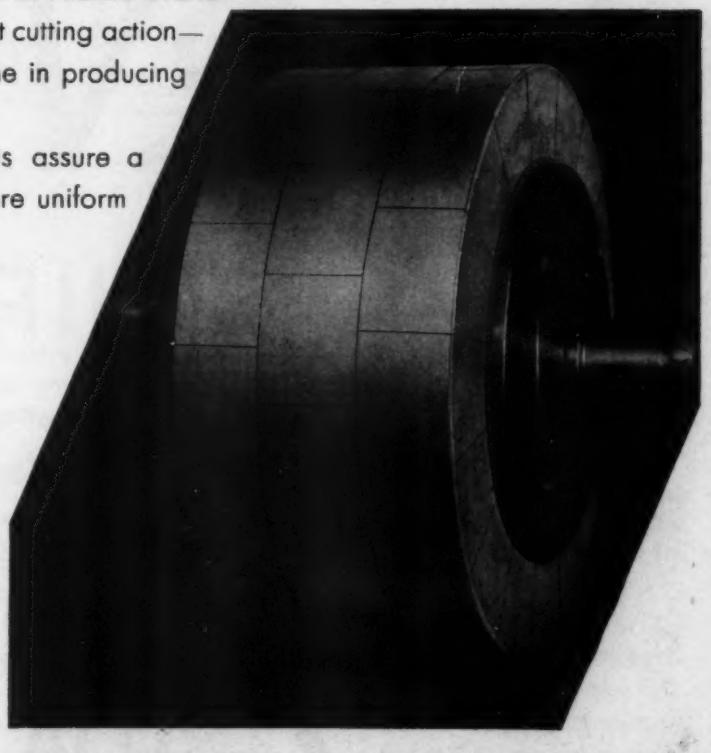

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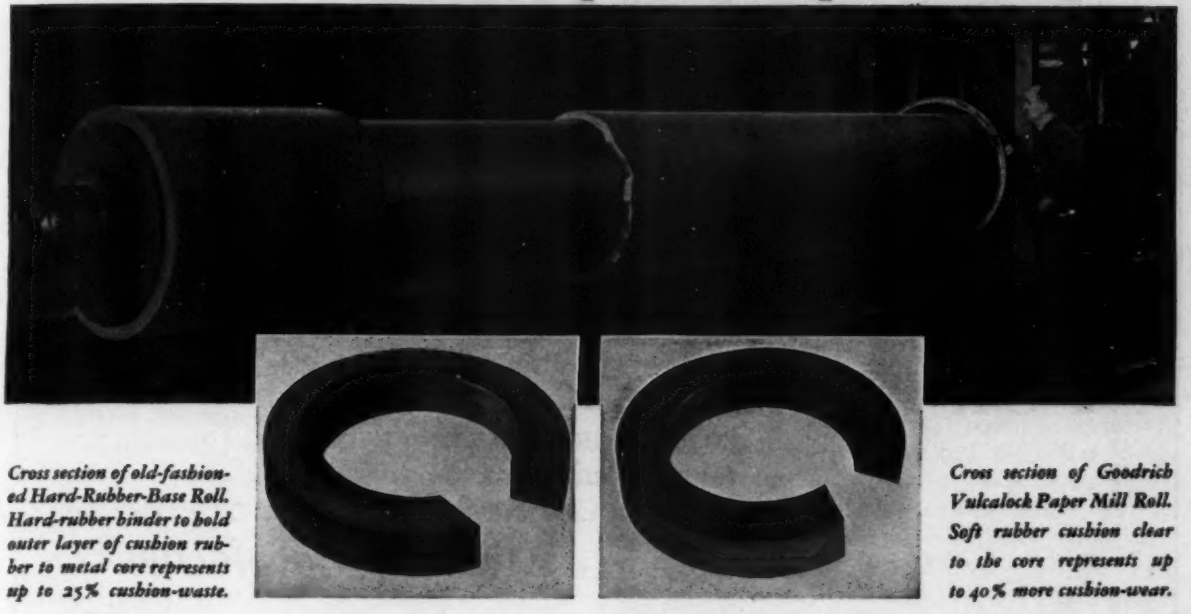

Cross section of old-fashioned Hard-Rubber-Base Roll. Hard-rubber binder to hold outer layer of cushion rubber to metal core represents up to 25% cushion-waste.

Cross section of Goodrich Vulcalock Paper Mill Roll. Soft rubber cushion clear to the core represents up to 40% more cushion-wear.

NOBODY wants a rubber-covered roll, even from Goodrich, with a part of the rubber cushion removed. But that is precisely what you get when you pay for the old-fashioned roll with a hard rubber base. You are cheating yourself out of years of useful cushion-wear unless you insist on an over-all soft rubber cushion clear to the core. Because hard rubber is dead rubber, it has no resiliency—no cushioning properties.

You had to have it, however, on the older type of rubber covered roll, because there was no known method of bonding soft rubber to metal base. You had to buy a roll with, say, three-quarters of an inch of soft rubber cushion; which was vulcanized to a layer of hard rubber, a quarter of an inch thick; which, in turn, was fastened by shrinking the hard rubber into threads cut on the metal surface of the core.

The Vulcalock process, discovered and used exclusively at Goodrich, changed all that. It provides direct adhesion between soft cushion rubber and metal base of 500 pounds to the square inch. Now you can buy soft rubber cushion clear to the core, without cushion-waste, at about the same price you paid for the hard-rubber-base roll.

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When Every Prospect Pleases

IT IS hard to write temperately regarding the outlook for business in these United States for this month of June, and in fact, for the coming summer.

However, no market observer can review the situation as it existed a scant ninety days ago and view it today without indulging in superlatives in an endeavor to give an adequate description of what has occurred.

The contrast well nigh defies portrayal, for the basic facts tell a story of such substantial business revival, the like of which we have never before known and which probably is without parallel in the records of this or any other country for that short space of time.

Ninety days ago, the volume of business in these United States was down to the abnormal volume in all lines of commodities of forty-seven per cent. On June first, the volume had expanded to sixty-one per cent of normal—a sheer rise of fourteen points or an increase of thirty per cent from the low.

This, in itself, is a factor of first business magnitude. It tells of the return of cheerful confidence so sadly lacking in the latter days of the previous administration. Both markets and factories are contributing to the sturdy expansion of business. Producers of commodities are facing an enthusiastic buying orgy which they have not experienced for years. We have turned the markets from the control of buyer to seller. Outstanding distributors of goods predict that we shall experience a buying panic within the next sixty days, and, before the summer is over, an acute shortage of commodities will face the buying public.

Steel has reached the highest production level in two years and the buying of that commodity shows not the slightest sign of usual seasonal abatement. Increased orders for motor cars are being placed weekly and the output is substantially ahead of that for the corresponding period a year ago.

The American Federation of Labor reports that during the month of May, 600,000 employees were recalled to service. This also is a fact which cannot be laughed off and from all the industrial sections of the country, reports tell of tens of thousands of employees being heartened and cheered with advances in salaries and wages.

The use of electric power is some eleven per cent above that for a year ago, buttressing the fact of renewed and expanded industrial activity.

The movement of freight is another corroborative fact. The reports for the last week of May showed some 20,000 cars in excess of the movement of the corresponding week a year ago.

Credit is expanding. Industry is receiving the voluntary support of Old Man Finance. The wholesale buyers and converters of raw material markets are boiling with increased activity, and last, but not least, the paper industry which, up to the first of June has been a lagger in the industrial awakening, has shown substantial signs of getting in line with the rest of the industrial conditions making its contribution to the welfare of commerce and industry.

All of these factors merely reveal to us a natural rebound from the abnormally low price and production depths to which industry had sunk, and the advance in prices and the rush to renew depleted stocks is but the natural consequence of the abnormal situation.

However, back, behind and underneath all of this

natural commercial and industrial phenomena lies the tremendous forces of inflation such as the American business operator has never faced before. Little or no actual inflation has taken place today.

It is still to be reckoned with. The big, fearless savior of American democracy and commerce is still on the job at Washington. He has not left his desk since his inauguration on March 4. He puts his finger daily on the pulse of the reviving corporate body. He is still able to keep the political forces working single-mindedly for the objective he has set which is the restoration of prosperous conditions for every man, woman and child in these United States. We believe he can be counted upon to maintain the control of the political forces along the lines to which he hitched them.

At any rate, the progress of the first ninety days justifies a continued confidence in the progress so far achieved and the promise that it will be maintained. Certainly, the outlook is pleasing.

The Beneficent Influence of Organization

A CENTURY OF PROGRESS, a spectacle of the ages, now on review in Chicago, causes one to retrospect on the progress made by the paper industry during the past hundred years. Some of its accomplishments were noted in an editorial appearing in the May, 1933, issue of THE PAPER INDUSTRY, but nothing was said of the progress that has come about through the coalescing of individual pulp and paper mills as well as the man power of these mills into a harmonious relationship which together have done much to mold the character of the industry's growth.

Among the agencies contributing to this coalescence are the trade press and the various associations created to promote the well-being of the industry.

The first American trade journal in the field did not come into existence until about sixty years ago. During the intervening years the trade press has kept the entire industry informed of most recent progress within the field and through this contribution has done much to stimulate research and progress.

The establishment of the association of manufacturers from which the present American Paper and Pulp Association emanated resulted from a convention that was held in 1878. It was not until 1915 that the Technical Association was organized, and even later was the organization of the American Pulp and Paper Mill Superintendents Association.

Contrast, if you please, the small fervent gathering of men who assembled on June 3, 1919, in the City Hall at Appleton, Wisconsin, for the first meeting of the American Pulp and Paper Mill Superintendents Association with the large and no less fervent group that recently assembled at Green Bay, Wisconsin, for the fourteenth annual national convention.

When the small group of superintendents assembled at Appleton for their first meeting, there was skepticisim not only on the part of mill managements but superintendents as well as to the success of such an organization. It was an untried experiment, at least as far as the paper industry was concerned, to bring together operating executives from competitive as well as noncompetitive mills with the primary thought of exchanging ideas and of being mutually helpful. The scheme was thought by some to be visionary and impractical, but the growth of the association during the past fourteen years has given ample proof of the practicability of the idea. In fact, it is believed that it would be difficult today to find any progressive mill management or progressive superintendent in the industry out of sympathy with the constructive efforts of the association. Certainly, this attitude is in contrast to the more common thought of only a few years ago.

Such developments as have been mentioned and others as well came no doubt from ideas that had smoldered in the minds of a comparatively few men who with little help had to fan carefully the ideas to keep them alive. Now the ideas have become institutions of realities, and upon them and other agencies yet unborn will rest the urge that will make for progress during the next century.

Plant Housekeeping

IT IS not necessary to stress the value of a clean plant. A clean plant is generally a safe plant in which to work. It is also a plant in which employees find pleasure in working.

Good housekeeping is as essential in the operation of an industrial establishment as in the home. Constant effort is required to keep everything in shape.

Now is the time to look over the entire plant and put it in order. This statement is particularly true if the plant is located in a region of cold winters where the closed season makes it difficult to do extensive repair work.

Do not let any part of the plant escape your critical inspection. Some little repair job completed now may save a large repair bill later on.

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PIGMENTS

for Paper Makers

PONOLITH HO — This pigment contains approximately 30 per cent zinc sulphide. It is low in cost and is recommended for use in the manufacture of paper where a high pigmentation is permissible.

TI-TONE P—This is an ideal, all-purpose, medium-priced pigment for increasing opacity. It consists of approximately 85 per cent Ponolith HO and 15 per cent Krebs Pure Titanium Dioxide.

KREBS PURE TITANIUM DIOXIDE—This pigment has a high index of refraction and is the strongest known pigment to impart whiteness and opaqueness to paper.

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Paper manufacturers are invited to solicit the aid of the Krebs technical staff to assist them in increasing opacity and whiteness of paper. Upon request samples of Ti-Tone P, Ponolith HO and Krebs Pure Titanium Dioxide, complete information and technical service will be given.

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THERE'S A KREBS PIGMENT FOR ALL TYPES OF PAPER

Partnership in Industry

By WILLIAM SIBLEY

LAST January, more than two months before the beginning of the "new deal," a prominent executive of the industry, in a letter addressed to the publisher of this magazine, said: "In my opinion, we have got to have liberalization of the anti-trust laws which will permit us to control production and have reasonable agreements as to price."

We now have that liberalization of the anti-trust laws in the enactment of the Industrial Recovery Act. The price we are going to pay is industrial autonomy.

Our anti-trust laws were very needed instruments to prevent monopoly and malicious price-fixing at the time they were enacted. That time has long since passed. Trade conditions have so changed during the past two decades that the force of the laws, originally beneficial, has become decidedly harmful. Under the protection of the anti-trust laws, a minority of producers (in every industry) can and do, either illfully or willfully, destroy industrial stability through substandard merchandise or the quotation of sub-standard prices. These minorities have had a devastating effect on business, and have been largely responsible for the delay in industrial recovery.

The iniquitous protection of obsolete laws should be removed. The anti-trust laws should have been removed ten years ago. Their protection is removed now, but at the price of another law, which, if the powers it grants be exercised, will sink industry to a level which will make our present troubles seem like child's play. The authorities granted by Senator Wagner's industrial recovery bill may never be used. The life of the measure is limited specifically to two years and it may be tabled as needless at the end of that period. But unless the present administration is different from every other administration, and unless the legislative history of the past hundred years fails to repeat itself in this instance, we will doubtless find in this law the necessary leeway for meddling politicians to exercise their power grants and precedents to plague industry for years to come. This is said because the national-recovery bill sets up an absolute federal dictatorship over industry. The measure sets aside all anti-trust laws, then permits the Federal Government to exercise positive monopoly.

Maybe Mr. Roosevelt is different. Maybe he is just the man to lead us out of the wilderness. We cordially and sincerely hope so. But precious few presidents have failed to use their executive powers to the utmost, and few administrations have relinquished authority willingly.

The obvious purpose of this new measure is first to persuade men to play fair—failing in persuasion, to force them to play fair. "Man's inhumanity to man" makes such a measure necessary. Because the inefficient or malicious will not "play fair" of their own volition, force is the only means to rationalize competition.

However, the power of this bill goes far beyond its obvious purpose. In Paragraph (b) of Section 4, for instance, we find the president empowered to issue or withhold the license to do business. How is that going to affect the small manufacturer who wants to start a plant for the utilization of waste product—only to be told he cannot do so since the field of production is already overcrowded? . . . That pulp mill, for instance, that wants to make a new kind of building material out of waste. That single supposition is cited only to indicate the possibility (and probability) of federal monopoly of industry through the granting, withholding or rescinding of licenses.

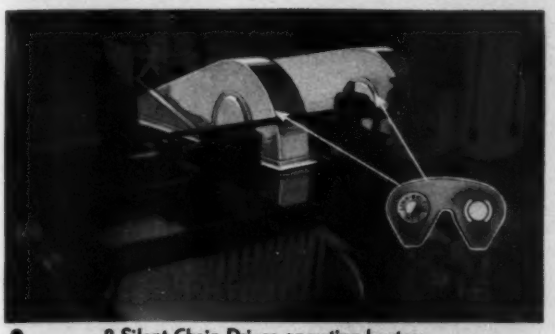
Under Paragraph (c) of Section 7 we find the president empowered to initiate and prescribe industrial codes, determine what is fair competition, fix minimum wage scales, maximum hours of labor, or alter the working "conditions of any trade, industry, or division thereof."

Under that authority, a dictatorial enthusiast might regulate the hours of operation of a tannery in Massachusetts, alter the wage scale of an Ozark grist mill, stop a farmer from slaughtering his own hogs for neighborhood sale, or close a pulp mill, if perchance that mill should be deemed needless because of Wildman Brookhart's "agricultural trade relations" with Russia which swaps wheat and cotton for wood pulp. So empowered, the president could regulate the activities, even the existence, of roadside stands selling canned fruit or vegetables; prevent the New Mexican Indians from disposing of their Navajo blankets; or force a paper mill to employ only union labor at a predetermined scale of wage, which might apply in Vermont but would spell ruin to the producer in Upper Michigan.

Through this measure, it is entirely possible for the Government to set up a vast bureaucracy with tens of thousands of employees and perhaps a propaganda department approaching in efficiency those of the Departments of Agriculture or Labor. There is no limit to either the number of employees or the amount of their salaries which the president and his appointees may consider necessary to carry out the provisions of this law. And probably the only thing which will prevent the institution of such a bureau is the short time limit given the measure.

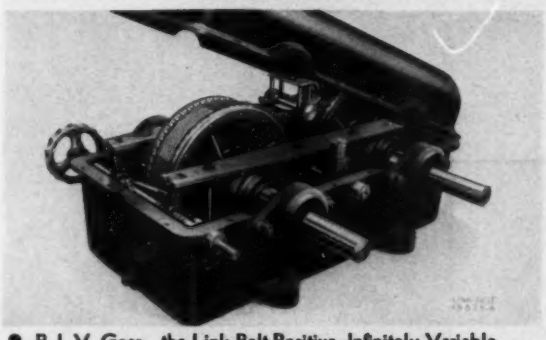
In this brief discussion I have cited only two or three of the possibilities under the authority conferred by this bill. But the power is there, and history clearly indicates that neither presidents nor congresses merit blind faith and trust. This measure must have the close attention of every industrialist during the next two years if it is not to establish ruinous precedents.

218 LINK-BELT Positive Drives in the Mills of Riegel Paper Corp.

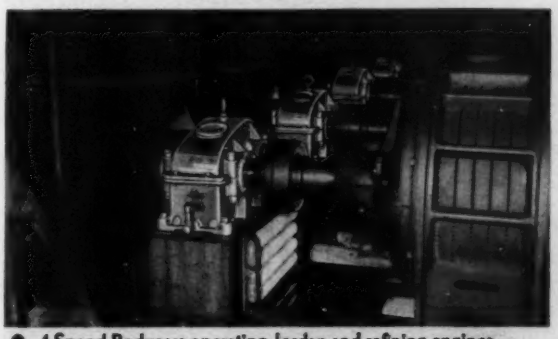


● 2 Silent Chain Drives operating beaters.

● Silent and Roller Chain Drives operating winding and slitting machine.



● P. I. V. Gear—the Link-Belt Positive, Infinitely Variable Speed Transmission.



● 4 Speed Reducers operating Jordan and refining engines.

16 YEARS ago Riegel Paper Corporation installed its first Link-Belt Silent Chain Drives. These continue to perform efficiently and economically . . . some with the original chain equipment. Today, Riegel has 218 Link-Belt Positive Drives in use, operating beaters, washers, stuff pumps, vacuum pumps, Jordan engines, screens, printing and waxing machines, etc.

These drives include 95 Link-Belt Silent Chain Drives . . . 70 Roller Chain Drives . . . 50 Herringbone-Gear Speed Reducers . . . and 3 P. I. V. Gear—Positive, Infinitely Variable Speed Transmissions . . . all transmitting power without slip or loss of R. P. M., irrespective of moisture or atmospheric conditions.

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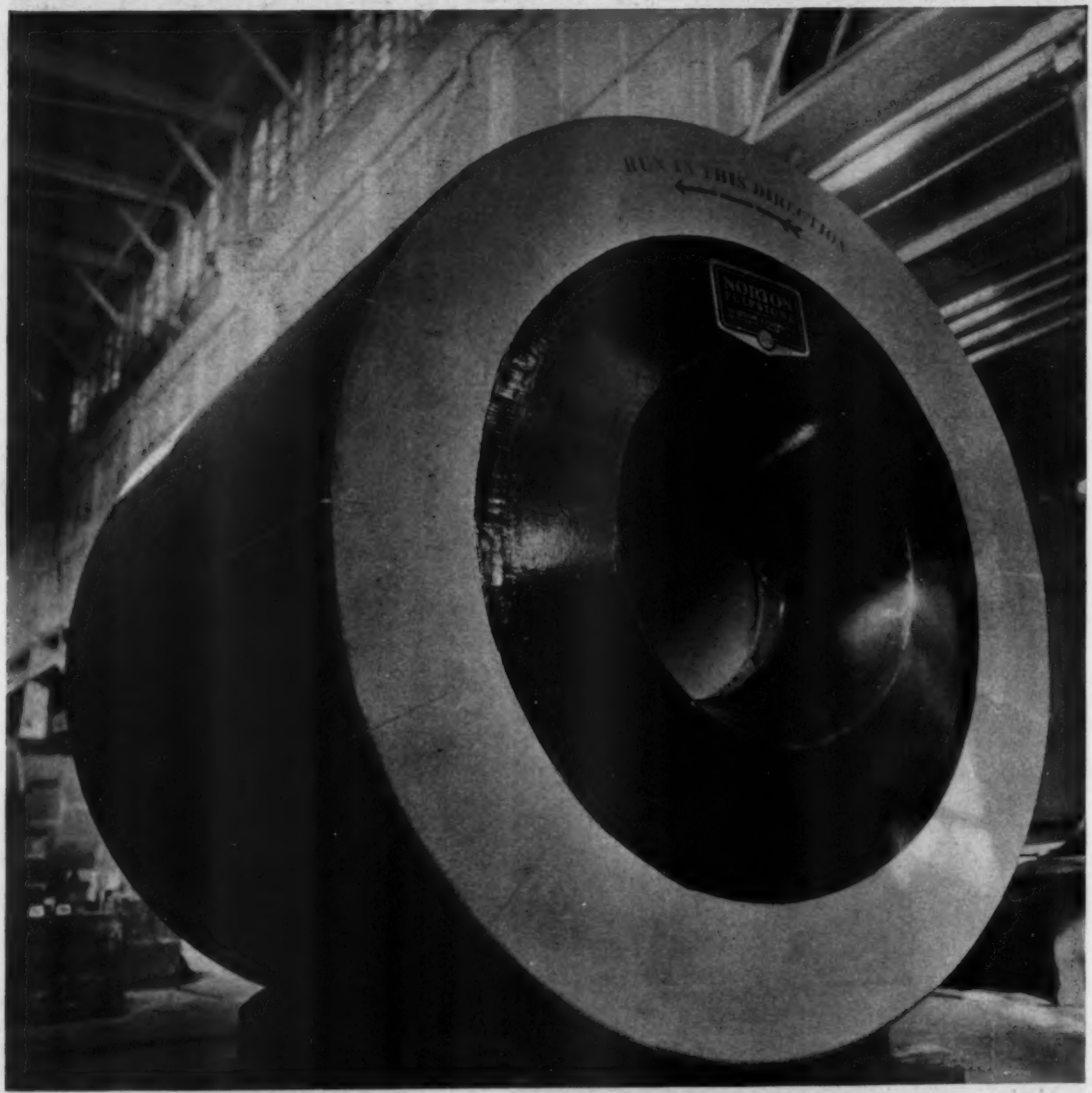

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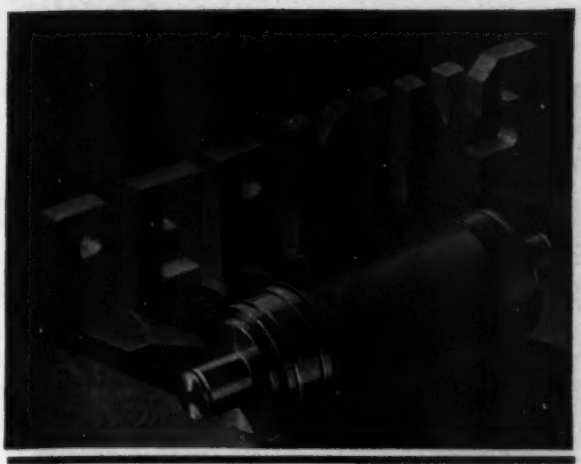

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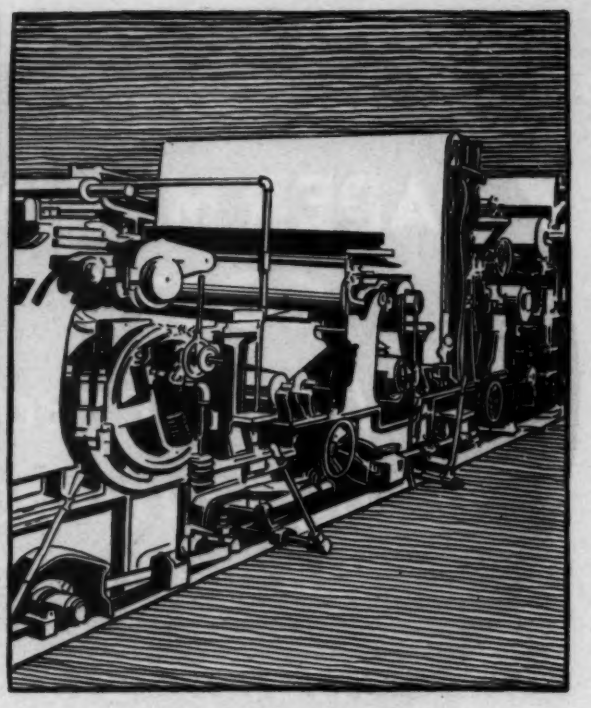

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THE PAPER INDUSTRY

A MONTHLY EDUCATIONAL JOURNAL

Research Is Here to STAY

By EDWIN SUTERMEISTER, Chief Chemist
S. D. Warren Company

WHAT is the future of research in the pulp and paper industry? That is a question which many would like to have answered, especially the younger technical men who still believe that it is possible to plan their lives with a reasonable degree of intelligence. While no one can answer this question with any great certainty, a few words about some of the tendencies may not be amiss.

The present unfortunate situation with regard to research seems to be the perfectly normal result of influences starting during, or very soon after, the World War. At that time, tremendous publicity was given to research and what it could accomplish, and it was held up to industry in general as its guiding star. As a result, many executives believed that all they had to do was establish a research department and they would live happily ever after. Many such executives were unable to select their research staffs properly and in most cases never even realized that such work cannot be done on a piece-work basis. It seems unfortunate that so many laboratories were established in that way and so many concerns were so impatient of results that their staffs never had an opportunity to show what they could really do, but under such circumstances it was inevitable that research, which went up like a rocket, should come down like the stick. Just that state of affairs was predicted by the writer ten years ago, although it was not anticipated that it would be so greatly aggravated by any general depression. It is realized that many will take exceptions to this opinion and will agree with Dr. Compton of the Massachusetts Institute of Technology in his statement: "If one-tenth of the money which has been lost in this depression had been put into a wisely-planned program of research, the other nine-tenths would never have been lost." The incompatibility disappears when the words "wisely-planned program" are considered, for it is believed that that many of the recent programs were not of that nature.

It appears that the pendulum has swung to the limit in one direction and that it must soon start toward the other end of the swing. Unfortunately, research is dependent on business conditions in general, since it cannot be carried out without a fair supply of what has been termed patient money. Under present conditions, business appears to have neither money nor patience, and in many cases even sanity seems lacking, so it is hardly to be expected that there is much chance for the research man until there is a distinct improvement in general business. As many plants even now are keeping a nucleus for a research staff, it seems reasonable to conclude that when more money is available research will be included on the program to an increasing extent.

The nature of the research tasks which have been undertaken by the different laboratories in the pulp and paper industry is quite properly unknown to the general public. It is considered to be proper because it is believed that by far the greater part of the work relates to improvements in existing processes or the development of new ones, rather than the investigation of fundamentals such as the constitution of cellulose and similar problems. Since such work has so immediate a bearing on the relative supremacy of any plant in its given field, it is hardly to be expected that it would be advertised very widely until the benefits from the work have been collected. While work of the sort mentioned might not rate strictly as research among the "*high-brows* of science, it is virtually the only kind considered in this discussion, since it is believed that it is the only sort which has any appeal to the papermaking fraternity. This is because it holds out more promise of immediate financial returns and because most of the members of the industry have not been educated up to an appreciation of the value of long range research. In fact, there are few individual plants or groups of plants which can afford to carry out such a program.

The present state of research cannot be laid to lack of problems, the solution of which would benefit the

industry as well as the individual plant which solved them. A very hasty glance over the various branches of pulp and papermaking shows innumerable chances for research, some of which have been with us for years while some are comparatively new. From these, the following have been selected, somewhat at random, as being of importance, but of rather general application.

Among the classics are the utilization of sulphite waste liquor and the preparation of useful materials from the black liquors of the soda and sulphate processes. It is certainly rather a severe criticism of our industry that over half of the weight of wood entering the digester goes out in a form which is valueless except as a fuel in the soda recovery process. Any useful work along these lines will have to be on the basis of producing a large volume of some cheap but readily marketable product.

In both the sulphite and soda processes, large amounts of cellulose are sacrificed in order to produce a pulp of the desired physical characteristics. In the case of the soda process, on poplar wood this loss may amount to as much as 450 lb. of fiber per cord of wood used. It is probably quite a bit less in the sulphite process, but is still very appreciable. Any concern which succeeds in saving even half of this loss will incidentally save much of its red ink bill.

The general conception of a fiber is that it resembles a smooth walled cylinder, but if the fibers are examined in the dry state they will be found very rough and fissured on the surface. Has this state of affairs anything to do with the papermaking value of the fibers, and does it influence the strength of the paper? Is it a function of the fibers themselves or is it influenced by the severity of the cooking process? If the latter, can it be used as an index of cooking and worked up into a control test?

The pebble mill beating test is extensively used as a means of testing fibers, but we are still very weak when it comes to interpreting the results. There seems to be a very wide gap between the pebble mill test and the practical results obtained in the mill, but no one can yet say whether this is due to the inaccuracy of the pebble mill test or because so many interfering factors make it impossible to judge the effect of fiber characteristics in the large beaters. A better means of converting the laboratory test into mill results is much needed, or else the pebble mill test should be discarded and something better substituted.

Another classic research problem is that of rosin sizing. This really should not be called a problem because it comes nearer being a hundred problems. It starts with the simple little affair of defining what sizing is and how it is to be measured and ends away out on the frontiers of science where the latest theories are being discussed. It is such a big collection of problems that any comprehensive work relating to it should be undertaken only by a well organized group of workers after a carefully co-ordinated plan of attack has been laid out.

In the coating of paper, research problems are so numerous that no attempt can be made to mention them all. Most of them are of such an intimate nature that it is best not to risk a discussion of them, but it is safe to say that a better material than our present satin white would be very acceptable and that the sealing wax test to show the strength of the coating is not always all that might be desirable. A better means of proving whether the paper will pick when printed would be very acceptable.

These are just a few of the problems that might be said to relate to individual plants. There are others which are equally important and in which research could do good work if co-operative efforts could be arranged. One such would be a study of factors affecting the permanence of paper, while another would be the relationship of paper, printing ink and press room operation. It is believed that studies along this latter line would be very profitable to all three branches of the industry. At present, such knowledge is very fragmentary and having been collected with entirely different objects in mind it is quite contradictory. If it could be correlated and some sound general principles established much progress would be made.

No, there is no lack of problems, and interesting ones at that. There is also no question that the industry stands in greater need of their solution than it ever did before. It is believed that most executives realize that such help is needed but that they are deterred by the expense and the impossibility of figuring the exact cost in advance. It is much easier to figure what a new machine will cost and what it will save over the old one, than it is to tell what profitable ideas can be extracted from a man's head.

Now a word or two as to the research workers themselves and the conditions under which they operate. Such persons are probably as varied in disposition and habits as the rest of the human race but it appears that they can be divided into several general groups. There are those who are wrapped up in their work and care for little but the opportunity to work on their problems. A second class might include those who do equally good work but make no bones about telling the world about it; while a third class consists of those who do but little work, and that of a rather sketchy nature, yet succeed in selling their services without difficulty. From the standpoint of the conscientious worker it appears to be a most unfortunate fact that the salesman type who presents very meager facts is given opportunities which are withheld from the quiet worker who has a much better general grasp of the situation. This is doubtless due in part to the lack of technical knowledge of many of those in charge of plant operations and to their inability to distinguish action from progress. It is a condition which seems to be unavoidable while our present type of business organization is maintained.

The young man who contemplates taking up research work as a profession should first take careful stock of himself and his tendencies. If he is very distinctly of the research type, he will have no doubt as to his calling and he will be willing to sacrifice much in order to work in his chosen field. If at the other extreme, he will find so many other lines of work more appealing that again there will be no question and he will decide against the general field of research. It is the unfortunate individual who belongs to the middle class and who has tendencies pulling him in both directions who is to be pitied. He should take very careful stock of himself and if he cannot fight down his introvert tendencies and cannot reconcile himself to having others climb to

higher positions over his shoulders he had better select some congenial line of work other than research.

To sum up the situation, *research is here and here to stay*, although it is now suffering a temporary set-back. In fact, research has always been here, although not necessarily under that name, for the organization which has developed new ideas and products has always been the one to be prosperous. The young man who really wants to do research should, therefore, have no hesitation in tackling the pulp and paper industry, for the density of ignorance in that line is probably fully as great as in any other.

Kraft Waste Heat Boilers ..... Part II*

By L. F. BUNDE, Engineer
Wisconsin Rapids, Wisconsin

ONE of the greatest difficulties in operating waste heat boilers with rotary incinerators in the past has been the entrance of excess air at the inlet to the rotary. This difficulty was caused by operating troubles involved in trying to maintain a reasonably tight seal between the smelter hood and rotary, and because of the necessity for providing a means for removing the black as from the rotary. The conventional smelter was a rectangular, two-pocket affair, into which the black ash was scooped by plates attached to the rotary shell. Such an arrangement operated well enough in installations without waste heat boilers, but it was probably the principal cause of failure where such boilers were installed.

Several designs are now in use to reduce air leakage between the rotary and the smelter. In some installations the sealing device is water-cooled, while in others hinged plates are held against the rotary end ring or shell by springs or weights. Both devices reduce air leakage to a minimum, but it seems that a part of the secondary air could be used as a cooling medium and also to improve combustion.

A number of smelter designs have been adopted in recent years to reduce refractory maintenance cost. These designs are almost without exception of cylindrical shape; and, although some do not attempt to cool the refractory, the use of air or water as a cooling medium is becoming increasingly popular. In one design primary air is circulated through a double jacketed smelter wall; while water is circulated through a similar jacket or through a wall of tubular construction in other designs. The latter design permits the smelter to function as a separate boiler, a steaming economizer, or as a water wall connected into the circulation of the main boiler.

The smelter unit installed in conjunction with the modernized Swedish system installation used an air-jacketed lower smelter and a water-cooled upper smelter or hood. Part of the water-cooled area was of tubular construction under boiler pressure; while the remaining area, including the air seal, was of welded plate construction and was under practically no pressure. This latter scheme is objectionable since it requires a large amount of cooling water that carries away heat at a low level and of quite limited usefulness. On the other hand, the heat in a wall of tubular construction under boiler pressure can be utilized for generating steam.

Liquor and Salt Cake Feeding

For most efficient operation, the liquor should be introduced into the rotary at as low a percentage of moisture as possible and yet fluid enough to handle. This moisture content, ranging from 30 to 35 per cent, creates a material of such viscosity that its temperature must be maintained near the boiling point in order to pump it. A low speed, positive displacement, variable speed pump is recommended for this service. Valve regulation of flow is very difficult.

The feeding of salt cake is done inefficiently in many of the units now operating. Most grades of salt cake are in a finely divided form. When such material is shoveled into the furnace dry, a part of it is carried by the disc evaporators to the stack and thus to the atmosphere. Recent tests indicate that this loss may be as high as $1.40 per ton of pulp production. Much of this loss can be eliminated by adding uniformly the chemical to the liquor before it is fed to the rotary. A number of proportioning devices now on the market may be used for this purpose.

Draft and Air Regulation

The introduction and control of air to produce a uniform CO_2 in the flue gas is the most important as well as the most neglected factor in the operation of waste heat units. Air and draft should be as accurately controlled in a unit of this type as in any modern stoker or pulverized fuel fired boiler plant.

The air supplied to the smelter through the blow pipes is from 25 to 40 per cent of the total air required for combustion. As the smelter actually acts as a modified gas producer, the secondary air should be added as soon as the reactions therein are complete or directly above the fuel bed where ignition temperatures are highest. If this added air is not brought in intimate contact with the CO, it might pass through the system unburned. For that reason, a definite amount of agitation or turbulence of air and gases is essential. These general principles were adhered to in so far as possible in designing the modernized Swedish system installation in which secondary air was introduced below the hood at right angles to the flow of gases. A damper in the boiler outlet, operated by a handwheel at the panel, together with a slip-ring variable speed motor on

*Continuation of article published in the May number of this magazine.

the induced draft fan constituted the control devices for the draft. The secondary air was regulated by a damper in the supply duct. This damper, likewise, was operated by a handwheel at the panel.

The application of control instruments to kraft waste heat fired boilers is another neglected factor of importance. There is no practical reason why control as applied to modern coal fired boilers cannot be applied to a waste heat boiler.

An instrument which would give a direct record of CO_2 in the flue gas would be most useful. In the selection of the instruments for the modernized Swedish system installation, however, a flow meter operating on the air flow-steam flow principle was specified as ruggedness and low cost were important requirements. Liquor to the smelter must be kept quite uniform in order that the accuracy of the flow meter be affected as little as possible by variations in moisture in the flue gas leaving the boiler.

Operation and Tests of Modernized Swedish System Installation

The actual results obtained through the operation of the installation of the modernized Swedish system, although somewhat under the expected performance, have been very satisfactory when compared with past practice for this type of unit. A typical performance test made on the installation may be tabulated as shown in the accompanying table.

In addition, the accompanying graphic illustrations show the performance of the unit at different capacities. Its expected steam output, if an economizer reducing the temperature of the flue gas to the disc evaporator to 500 deg. Fahr. were added, is included in one of the charts.

From observations and tests upon this unit to date, it is believed that certain changes to increase steam output should be incorporated in the design of future units. Anyone familiar with the operation of the Swedish system is aware of the almost absolute lack of flexibility of such a unit. The evaporating capacity of the rotary governs the operation of the rest of the unit including the steam output where waste heat boilers are installed. The following suggestions covering design changes are offered as a means for overcoming this objectionable feature:—

1—A movable feed pipe, adjustable while in operation, would permit the point in the rotary at which the liquor is introduced to be varied, thereby controlling, over a certain range, the evaporation in this piece of equipment.

2—A method for withdrawing a part of the black ash to permit the supply of dry fuel to be varied would improve the operation of the smelter, which is quite critical for good recovery.

3—Both smelter and hood should be made of tubular construction to operate under boiler pressure.

4—Diameter of rotary should be increased to reduce gas velocities.

5—Economizer should be added if maximum steam output is desired.

6—A device should be installed to automatically maintain the viscosity of the liquor that is fed to the unit.

The primary purposes behind these changes would be to decrease the heat carried away in the cooling water, and to decrease the flue gas temperature leaving the boiler or economizer. As an additional comment, it might be said that chemical recovery takes place entirely in the smelter, while steam generation is affected

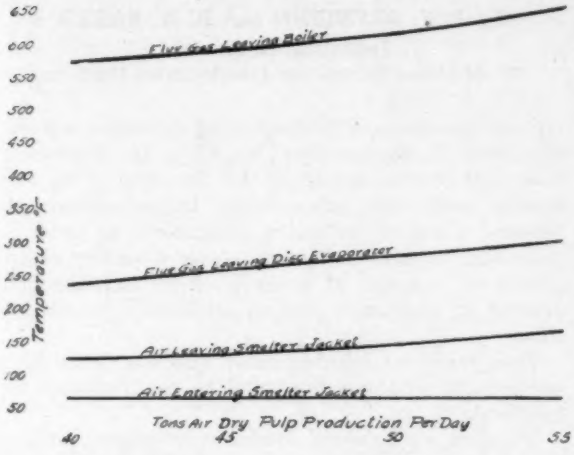
GENERAL DATA

1.	Per cent solids in liquor to disc evaporation	48
2.	Temperature of liquor to disc evap. ° F	167
3.	Per cent solids in liquor to rotary	68.5
4.	Temperature of liquor to rotary ° F	178
5.	Steam pressure per sq. in. and % moisture	147-1%
6.	Feed water temperature	234
7.	Cooling water temperature ° F	36
8.	Room air temperature ° F	68
9.	CO_2 in flue gas boiler exit %	14.4
10.	CO in flue gas boiler exit %	.109
11.	Flue gases leaving boiler ° F	620
12.	Flue gases leaving disc evap. ° F	280
13.	Salt cake per ton of pulp	332

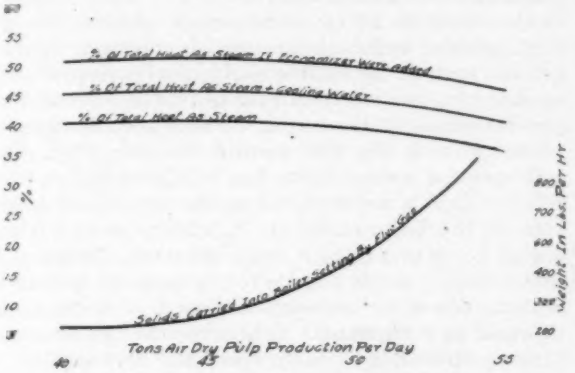
	Heat Distribution Per Ton of Pulp Production	B. T. U.	Per Cent
1.	Heat of Reduction	1,032,000	4.34
2.	Heat of Fusion	85,000	.36
3.	Dissolving tank loss	1,046,000	4.42
4.	Evaporation in smelter	230,000	.97
5.	Evaporation in rotary	1,370,000	5.78
6.	Evaporation in disc evaporation	2,730,000	11.53
7.	Loss in flue gas leaving disc evaporation	1,508,000	6.70
8.	Loss due to hydrogen in fuel	497,000	2.10
9.	Loss due to moisture in air	190,000	.80
10.	Loss due to CO in flue gas	1,116,000	.49
11.	Heat carried away in cooling water	2,046,000	8.75
12.	Heat in steam from boiler	9,460,000	39.90
13.	Radiation and unaccounted for	3,590,000	13.86
	Total B. T. U. available in liquor (Heat of combustion plus sensible heat in liquor)	23,700,000	100.00

practically only by the treatment of the gases after they leave the smelter. Considered from any angle, the conditions which promote good boiler operation also promote good recovery.

The principal reason that chemical pulp waste heat boilers in the past have been inefficient or indifferently


Temperature
Flue Gas Leaving Boiler
Flue Gas Leaving Disc Evaporator
Air Leaving Smelter Jacket
Air Entering Smelter Jacket
Tons Air Dry Pulp Production Per Day

successful is that such installations were, in most cases, engineered and installed by pulp mill operators rather than by combustion engineers and steam plant designers. With due respect to the operators, they were entering a highly specialized field in attempting such work. Wood substance in the liquor is a specific fuel and re-


% Of Total Heat As Steam If Economizer Were Added
% Of Total Heat As Steam + Cooling Water
% Of Total Heat As Steam
%
Solids Carried into Boiler setting By Flue Gas
Weight In Lbs. Per Hr
Tons Air Dry Pulp Production Per Day

quires specific treatment to obtain best combustion results. It is an engineer's problem and the field for improvement over present practice is quite extensive. Of course, in utilizing the services of an engineer for such work, it is absolutely necessary to have close co-operation between the engineer and pulp mill operator both before and after the installation is completed.

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◆ AT THE annual meeting of the Chamber of Commerce, President Roosevelt said: "I ask that you translate your welfare into the welfare of the whole, that you view recovery in terms of the nation rather than in terms of the particular industry or the particular unit of a particular industry, that you have the vision to lay aside special and selfish interests, that you have vision to think and act for a well-rounded national recovery.

Lithographic Papers Affected by Humidity

PHYSICAL tests to determine the strength properties of lithographic papers at different relative humidities ranging from 28 per cent to 72½ per cent were made recently at the Bureau of Standards. The results indicate that the strength of such papers varies according to the relative humidity of the atmosphere surrounding them, but different properties follow different trends with humidity changes. In general, the resistance of paper to tearing, or breaking when folded increased as relative humidity went up and decreased as it went down as a result of improved flexibility imparted by moisture absorbed from the air; but the resistance to tensile breaking and bursting decreased as the humidity increased.

In the vicinity of 50 per cent relative humidity, an increase in relative humidity of 10 points increased the folding endurance and tearing strength approximately 10 per cent and decreased the bursting strength and tensile breaking strength approximately 1 per cent and 5 per cent, respectively. Variations in strength of such magnitude are apparently not significant in printing plants having atmosphere controlled within reasonable limits. However, extremely large changes in humidity should obviously be avoided.

Further information has been obtained at the Bureau of Standards to assist lithographers in overcoming misregister of successive color prints, which is the most prolific source of waste in the industry.

Five samples of lithographic papers, representative of the different types of papers most commonly used in offset printing, have been studied at eight different temperatures, ranging from 68 deg. Fahr. to 110 deg. Fahr. Dimension changes, the most common cause of misregister, were determined by measuring specimens approximately 24 by 24 inches to .001 inch, and moisture content changes were determined by weighing somewhat smaller samples on a chemical balance to .0001 gram. The relative humidity was maintained constant at 45 per cent throughout so that the temperature was the only factor varied.

The temperature changes resulted in regular moisture content changes, the average change being 0.2 per cent per 10 deg. Fahr. temperature change for the five papers studied. The moisture content varied inversely with the temperature, that is, the moisture content of the paper went down as the temperature went up and increased as the temperature fell.

All changes in moisture contents of the papers were accompanied by proportionate dimensional changes. The same relationship between moisture content and dimensions was found to exist as when moisture content changes resulted from humidity variations, and a single smooth curve was obtained when plotting moisture contents against dimensions with both temperature and relative humidity varied. Therefore it appears that the dimensions of such papers vary directly with moisture content regardless of whether moisture content changes result from variations in relative humidity or temperature, at least within the range ordinarily encountered.

Light Sensitive Control in the Paper Industry

By J. V. ALFRIEND and R. R. BAKER
Industrial Engineers
Westinghouse Electric and Manufacturing Company

IN THE paper industry there are many processes where control of concentration of liquids is a necessity. The concentration of acids in the paper stock suspension and the concentration of caustic in the alkaline wood pulp processes are typical examples of the type of liquors that must be controlled.

For years the control of these concentrations has depended upon the expensive, slow and inaccurate method of colormetric analysis. Expensive and slow because it must depend upon human observation, and inaccurate because of the human element in the examination. The control is further complicated by the fact that the analyst must take corrective measures and either hopes that they are sufficient or valuable time is wasted waiting for the correction to take effect before he can obtain a check sample.

Recent developments in the matching of colors, measuring the intensity of smoke, and the automatic control of illumination by photo-electric means indicated that colorimetric process control might be obtained automatically by some modification of this new equipment which had been proven commercially successful. A study was made of the variables encountered and their effect upon the photo-tube. It was found that in the majority of cases where a clear liquor can be obtained and an indicator added, the photo-tube can very accurately measure the hydrogen ion concentration and instigate necessary corrective action to maintain hydrogen ion concentration at a given point.

One interesting result of this study was that in all types of automatic control involving hydrogen ion concentration it was necessary to allow an inoperative time after each correction so that the effect of the correction could take place before the equipment attempted a second correction. Therefore, in order to make such equipment operative over a variety of applications, it must, of necessity, have an adjustable amount of correction and an adjustable inoperative time.

Two concentration regulator schemes have been worked out and are presented to the industry for approval.

The first, or *balanced bridge* arrangement, utilizes two light sensitive photo-tubes which simultaneously inspect the light transmitted through a sample of the liquor of unknown concentration taken from the process and the light transmitted through a standard colormetric sample of known concentration. The second, or *null* method, uses a single photo-tube inspecting simultaneously the light transmitted by the unknown sample and the known sample.

The balanced bridge arrangement utilizes proven light sensitive circuits to accomplish automatic hydrogen ion control. It has the slight disadvantage of requiring recalibration from time to time because of the possible ageing of the tubes. No such recalibration is necessary with the *null* method because, when the hydrogen ion concentration has been corrected a zero response is obtained from the equipment. The advantage of the balanced bridge regulators arrangement is that it can also be used as an indicator, whereas the *null* method does not provide for its use as an indicator without means for recalibration which it is designed to avoid as a regulator. Otherwise, the two schemes are very similar in economy, speed and accuracy.

Figure 1 shows a balanced bridge arrangement of

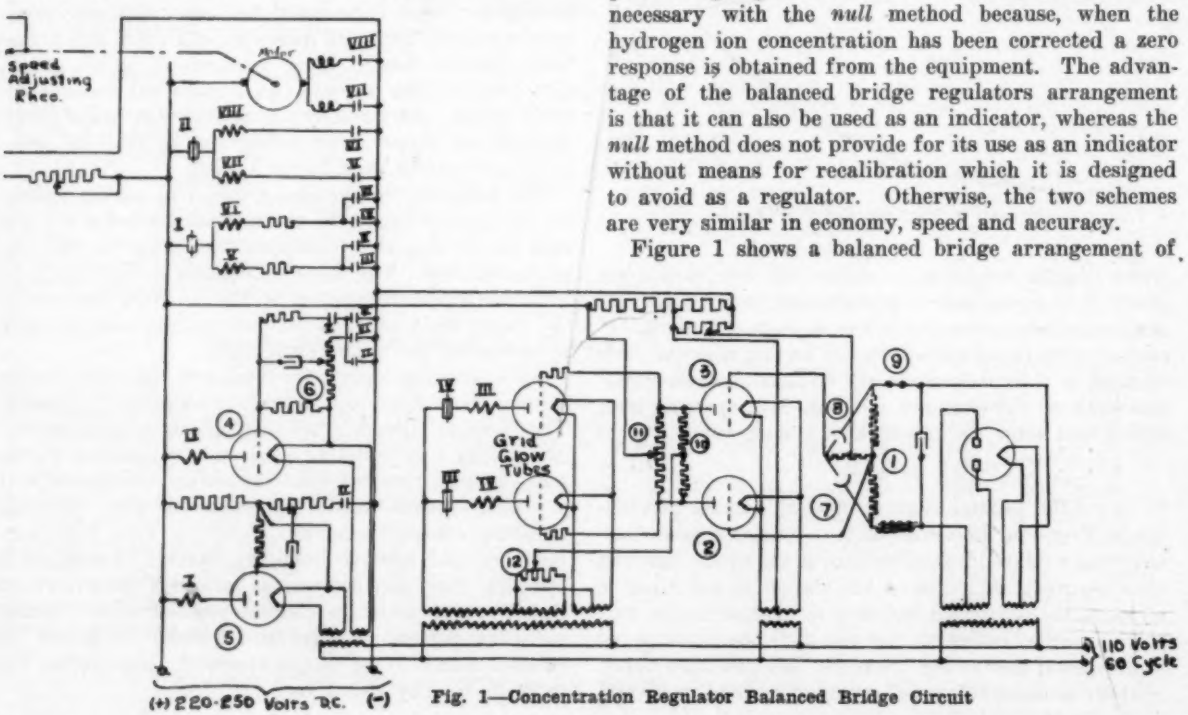

Fig. 1—Concentration Regulator Balanced Bridge Circuit

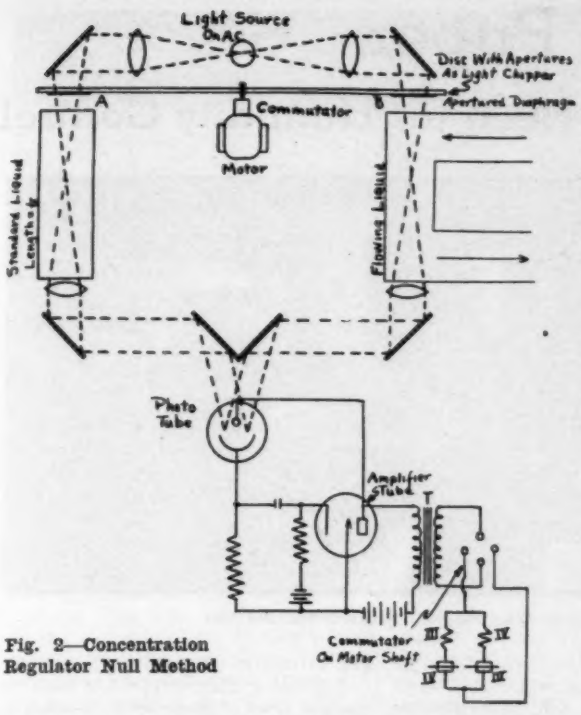

Fig. 2—Concentration Regulator Null Method

photo-tubes designed to regulate the hydrogen ion concentration. The mechanical equipment such as sampling, filtering, adding of indicator and placing before the photo-tube are omitted because these features will change with individual applications. It should be noted that only minor changes of the equipment shown in the diagram are required to make it applicable to the control of the solenoid or motor operated valves, or motor operated rheostats and similar equipment encountered in regulating the flow of solids, liquids and gases. (Figure 1 indicates motor operated rheostat.)

Two photo-tubes, 7 and 8 in Figure 1, are connected in a Wheatstone bridge circuit which is supplied with direct current by a *B* eliminator. These tubes are illuminated from the same light source which is not shown in the diagram. In front of one tube is placed a standard color sample, while the fluid to be controlled flows through a similar glass tube in front of the other photo-tube. It is apparent that any variations in light intensity due to varying lamp voltages will not have any effect on the balanced bridge circuit. If the hydrogen ion concentration of the unknown fluid changes, the bridge becomes unbalanced which unbalances the bias on the amplifier tube and causes current to flow through one of the two grid glow tubes. This sets in operation the relay circuits which cause an adjustment to be made in the supply of the varying chemical and which also sets in motion the two timing circuits. These two timing circuits provide the adjustable amount of correction and the adjustable inoperative time mentioned as being required from this sort of device.[1]

As previously mentioned, the *null* method was designed to eliminate the necessity for recalibration involved in the balanced bridge arrangement; both arrangements, of course, being equally flexible in regulating hydrogen ion concentration of a given solution by controlling the feed of the variable constituent.

Figure 2 shows the *null* method photo-tube circuit, which is interchangeable with the balanced bridge circuit shown in Figure 1. For a concentration regulator, either photo-tube circuit may be used with the same timing equipment shown on Figure 1. (Relays III and IV are identical in Figures 1 and 2.)

Briefly, the *null* method operates on the following principle: The light beams from a single light source are directed through a system of mirrors and lenses through two different paths onto a single photo-tube in such a manner that one beam passes through a standard color sample and the other beam passes through the unknown liquid. An apertured diaphragm is rotated in the path of the two beams so as to vary the cross section of the beams permitted to pass through the two liquids. The sum of the apertured areas *A* and *B* are always equal to unity. The aperture *A* varies from zero to 100 per cent while the aperture *B* varies from 100 per cent to zero.

Thus, if the light transmitting qualities of the two liquids are identical, the illumination of the photo-tube will be unchanged as the diaphragm is rotated and therefore the output of the amplifier tube or its plate current will be constant direct current. With constant direct current impressed on the primary of the transformer *T*, there will be no output from the secondary, and relays III and IV will not be energized.

If the light transmitting quality of one of the liquids deviates a small amount from that of the other, the illumination of the photo-tube will vary as the diaphragm is rotated and the plate current of the amplifier tube will therefore become a pulsating direct current. With pulsating direct current impressed on the primary of the transformer *T* the secondary will deliver only the alternating component which in phase position and magnitude will be proportional to the deviation in light transmitting qualities of the unknown fluid from that of the standard fluid. Since this alternating component is rectified by a mechanically driven commutator on the shaft of the motor which drives the diaphragm, the direct current obtained will be proportional in sign and magnitude to this same deviation in light transmitting quality. With relay III set to pick up at a minimum value of positive current, and relay IV set to pick up at a minimum value of negative current, the corrective control circuit and the timing cycle shown in Figure 1 will be set in operation.

Since this circuit is a zero or *null* method and this feature is obtained by filtering out the direct component of the plate current of the amplifier tube, the regulator is insensitive to gradual changes of temperature or voltage.

The concentration regulator schemes presented provide the accuracy, reliability and economy required of such devices. They also provide an adjustable amount of correction for each sample observed together with an adjustable inoperative time while awaiting the effects of one correction. Thus, the equipment as designed may be applied to various uses, the major problem being the manner in which the unknown sample is prepared and placed before the eye of the photo-tube.

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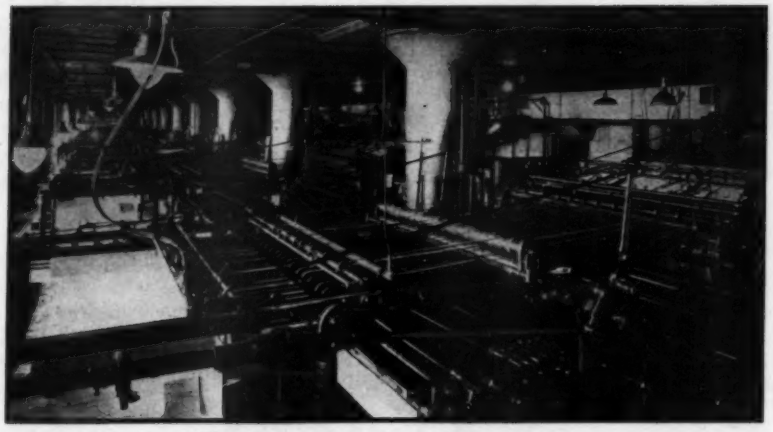
[1]For detail description of the operation of this control circuit see *Light Sensitive Process Control* by J. V. Alfriend, Jr., A. I. E. E. Paper No. 33-45, presented at the Mid-Winter Convention of the A. I. E. E., New York, January 23-27, 1933.

Hygroscopicity of Paper

Develops Need for Humidity Control

By B. OFFEN
Air Conditioning Engineer



Flat-bed two-color pressroom supplied with conditioned air

THE printer, lithographer and manufacturer of paper products are continually faced with the problem of moisture content of paper and the humidity control of the air in the plant. Paper that is not uniform in moisture content results in non-uniform stretch or contraction and develops curled as well as wavy edges. Such a sheet causes considerable trouble.

Paper is very hygroscopic. It readily picks up moisture in humid air and gives up moisture in dry air. If freely exposed to the air, paper will quickly adjust itself to the moisture in the air and arrive at a point of balance or equilibrium. The average stock exposed to air at 20 per cent relative humidity will contain an average moisture content of 3.5 per cent. This same stock exposed to air at 70 per cent relative humidity will raise its moisture content to about 8 per cent.

The Bureau of Standards has made exhaustive tests to ascertain the increase in length and width of a sheet exposed to different relative humidities. From these findings, it is conservative to say that a sheet 48 inches by 60 inches, when exposed to a change in relative humidity of 30-40 per cent, will increase ¼ to ⅜ of an inch in length. This increase in length may appear to be unusual, but plants at different times have experienced this, or nearly this, condition due to unseasonable weather changes.

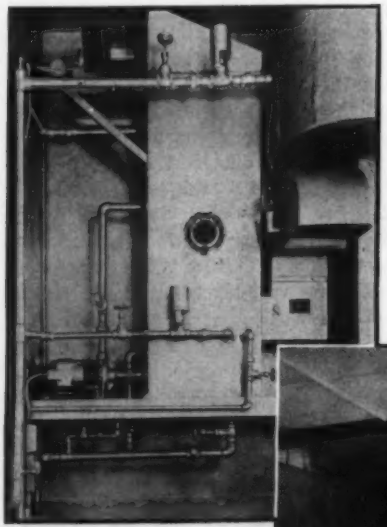
A review of the daily records of the U. S. Weather Bureau will show changes in relative humidity from 25-90 per cent for quite a number of days. Of course, the daily temperatures are partly responsible for the wide range. Further investigations will show that for practically every day in the year there are changes in the relative humidity of the air of 25-50 per cent. This is due to the cool evening temperatures and warmer afternoon temperatures in addition to the variations of moisture in the air.

A printing plant exposed to such variations must of necessity keep windows closed to prevent such fluctuations in the plant. Keeping the temperature from falling below a certain point also reduces considerably the extent of the variations. Yet, practically all unconditioned plants will show variations of 20-40 per cent in relative humidity depending on the condition of the outside weather as well as the condition within the plant.

Color work requires absolute control of the sheet. Accuracy and precision are required in the preparation of plates for high class work. Considerable make-ready time is used to obtain perfect alignment. Yet not an unusual change in humidity in the press room will affect the dimensions of the sheet to the extent that it will throw out of gear all of the above outlined work.

When one considers the efforts directed to obtain accuracy on the press it is reasonable to assume that negligence has been allowed to carry on with regard to the control of paper. Where paper has changed in a run that is partly finished, quite frequently the paper is racked in a heated room and exposed to circulating fans to remove the excess moisture. This treatment makes the sheets uniform even though it may not bring the paper back to its original dimensions.

Sheets in stack form will wrinkle and curl when the moisture in the air is not balanced with the moisture in the paper. The edges of the sheets, to the extent of 2 inches to 3 inches inside the stack, will either give up moisture or take on moisture. The fact that the entire sheet does not expand or contract uniformly causes the edges to wave and curl. This puts an added strain to the edges. Sometimes these curls and wrinkles cannot be taken out



Above—Unit for temperature and humidity control of laboratories

Right—General view of air conditioning apparatus for maintaining proper temperature and humidity

Offset department of printing plant showing diffuser outlets in conditioned air supply duct

Air-conditioned box-making and assembling room. Note air supply outlets

if the expansion has gone beyond the elastic point.

A wavy sheet may be considered as equivalent to a warped surface. The excess surface of the sheet will result in a wrinkle when run on the press.

Plants that are unconditioned and carry a humidity that is very low develop a high static electricity. Humid air acts as a conductor and carries away static developed in the sheet. Not all of the static is removed through the air, but it removes sufficient to allow the paper to be continually put through the press.

Binderies and manufacturing plants usually suffer from lack of humidity rather than too much humidity. A high moisture content in the stock permits of a more satisfactory folding and creasing without cracking of the surface. The proper moisture content in the air reduces the static to a negligible point and permits satisfactory work on the various types of assembling machines.

Paper for printing and lithographing should be stored in a room containing the desired relative humidity. If the paper is stored in a separate room, considered as a paper storage room, a relative humidity should be maintained in this room similar to that maintained in the press room. In other words, if a press room is operated at 55 per cent relative humidity, the storage room should be maintained at 55 per cent relative humidity. Under this arrangement, there is no chance for the paper changing at any time while it is being converted to a finished product.

It is important, of course, that the paper delivered to the plant from the paper mill or warehouse has a moisture content balanced to the moisture of the air in the plant. Assume, for example, that paper exposed to the air at 55 per cent relative humidity contains 6 per cent moisture. Then paper brought into the plant should contain 6 per cent moisture. With this arrangement there is very little chance for any change taking place in the paper. But should the paper be received with a moisture content different from that desired, the paper will have to adjust itself to the plant condition. If in stack form, wavy ends and curling will develop necessitating the stacking of the paper and circulating air through the paper so that it will become adjusted and uniform to the air in the room.

Several plants have equipment to rack paper and to circulate air through it because the moisture content of the paper furnished them is different from that which they can use. Storage rooms at the source of supply, whether mill or warehouse, should maintain a humidity at a point averaging what may be desired by the printing plants. If paper is stored sufficiently long at the source of supply in a dry or humid room, the sheet when delivered to the plant will have to be thoroughly seasoned before it can be used. The importance of maintaining a uniform moisture content in the entire sheet cannot be overstressed since uniformity in moisture content means uniformity in the physical dimensions.

Considerable difference of opinion, however, exists regarding the relative humidity to be maintained in printing and lithographing plants. Certain plants operate satisfactorily with humidities at 45 per cent and others with humidities as high as 65 per cent. It is understood, of course, that once a plant selects a relative humidity within the above range that it maintain that humidity constantly. In other words, if a plant decides on 50 per cent, it should maintain its storage room at 50 per cent and adjust all the paper to 50 per cent. The same procedure should be followed by a plant that prefers 65 per cent relative humidity. No plant can vary humidity anywhere between 45-65 per cent and expect satisfactory results.

Printing and lithographing plants, nevertheless, can operate at any temperature from 75 deg. Fahr. up to a reasonably comfortable point. In fact, some plants are operated at 75 deg. Fahr. and others at 80 deg. and even 85 deg. Fahr.

Some printing and lithographing plants today are equipped with complete air conditioning apparatus, including dehumidifying. Such an arrangement of apparatus will maintain a predetermined temperature and a predetermined relative humidity at all times. Such a condition, of course, is ideal, but not many plants can afford the investment.

It is economical, nevertheless, for a plant to install a humidifying, ventilating and cooling system without dehumidifying apparatus. Such an arrangement permits humidity and temperature control during the winter and cool intermediate periods, and humidity control during the summer by increasing the temperature. The regular air washing equipment, however, as part of the system permits the temperature to be maintained close to 85 deg. Fahr., not a bad temperature when the outside atmosphere is 90 deg. or over. Such a system when properly designed and installed pays for itself in approximately three years.

Cannot the paper industry profit from similar installations?

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◆ Decision of Customs Court on Swedish Kraft

The United States Customs Court has rendered decision upon review in two cases involving Swedish kraft paper, one being of a special machine glazed type, and the other a standard grade. In each case the court allowed the dutiable value claimed by the importer, which is about 1 cent per pound less than that at which the customs officials fixed the proper value. In the case of the envelope kraft for Springfield envelope manufacturers the ruling was that the invoice price was correct, as it was made especially for the American market, and had therefore no home market value. In the case of the standard kraft, the court held that inasmuch as such paper is only sold in counter rolls and sheets in England, the sale in jumbo rolls for the United States made it a paper without a home value, and therefore dutiable at the basis on which invoiced.

Customs officials have refused to admit Swedish kraft wrapping at Los Angeles on a dutiable value of 1⅓ cents.

Testimony in a test case as to dutiability of lamp shade bristol has been completed at Philadelphia. This was the second hearing on this case in Philadelphia, in addition to the hearing at New York.

Superintendents Meet at Green Bay

Fourteenth annual convention reflects optimism. Program extensive and all sessions unusually well attended

BETTER days are here again if the atmosphere of the fourteenth annual convention of the American Pulp and Paper Mill Superintendents Association may be taken as a criterion.

The convention, held on June 8, 9 and 10, 1933, at Green Bay, Wis., was not only unusually well attended, but was also pervaded with a spirit of unbounded optimism. The registration alone included the names of approximately five hundred persons, including superintendents and guests. To some the trek to Green Bay was a long one, for there were those in attendance from Newfoundland, the Atlantic coast states, the South, the Pacific coast, and intervening territory as well as from Canada. All of them seemed to bring news of good cheer—increased operation of mills, and more business.

As a preliminary to the convention proper, the convention committee staged a sports jamboree on June 7, and that same evening the Ancient Order of Chinese Paper Makers, with Fred C. Boyce in the role of Confucius, held its initiation exercises. Both of these functions brought many to the convention early, and today finds some of them better golfers, better trapshooters, and perchance better papermakers since the mysteries of ancient Chinese art was said to be revealed to some of them.

With the play day over, the convention was called to order promptly at 10:00 a. m. on the morning of June 8 in the Crystal ball room of Hotel Northland by F. J. Timmerman of the Northern Paper Mills and general chairman of the convention. Mr. Timmerman then turned over the gavel to William H. Brydges, president of the association, who presided throughout the rest of the convention.

Invocation was pronounced by Rt. Rev. Paul P. Rhode, D.D., Bishop of the Green Bay Diocese, and the secretary read the "In Memoriam." John V. Diener, Mayor of Green Bay, was then introduced and in a very pleasing manner he welcomed every one in attendance to the city of Green Bay. He told how deeply grateful the city was to its local paper industry, mentioned that Green Bay was to celebrate its 300th birthday next year, and invited every one to return at that time. Herbert Randall of Champion Coated Paper Company, who at a later session of the convention was elected president of the association for the ensuing year, responded to Mr. Diener and thanked him for his hearty welcome.

The president, William Brydges, then read his message. In his message were stressed the problems of foreign competition and depreciated currencies as well as price stabilization. He also outlined the privileges of membership in the association and emphasized the responsibility of the association to the industry of which it is a part. In concluding his remarks, Mr. Brydges offered his congratulations in behalf of the association to the executives of the pulp and paper mills of America and to the machinery manufacturers and the equipment and supply people, and expressed his appreciation to every one who in any way had helped to make the past year as well as former years of the association successful.

Many Papers Presented at Thursday Sessions

After the appointment of committees by the president, the first paper of the formal program, a joint paper by J. W. Stack and A. Hutchinson of the Standard Oil Co. (Indiana) was read. This paper, divided into two parts, touched upon the lubrication of ball and roller bearings, and the lubrication of gear reduction sets. It was pointed out that in the selection of the type or grade of lubricant best suited for any particular ball or roller bearing installation there were two important factors to consider: namely, the speed and the temperature at which they will operate; and the method by which the lubricant is to be applied, or the type of lubricating system.

In discussing the lubrication of reduction gears, the spur, helical, herringbone, spiral bevel, mitre, worm, and hypoid types of gears were each touched upon. Methods of lubricating these various types of gears were explained briefly with emphasis being placed upon the lubrication of the worm and the hypoid. The hypoid gear was said to be one of the outstanding developments in gear drives for the pulp and paper industry within recent years, and that the oil industry in co-operation with gear manufacturers had developed three general classes of lubricants for this service. These lubricants were designated as sulphurized oils or greases, lead or zinc soap lubricants, and oils or greases containing chlorides. It was further pointed out that the essential points to consider in the selection of such a lubricant were stability of lubricant and the degree of abrasiveness of the lubricant.

Visual education has been emphasized by many educators in recent years, but it is believed that never was its value more clearly shown than by Allen Hyer of the Black-Clawson Co., Hamilton, Ohio, who in the next paper actually built up from jig-saw puzzle-like parts a modernized cylinder machine before the eyes of a most attentive group. As his background, he used a mill interior sketched on building board and upon which the felt lines of this machine were shown. He pointed out that the top felt was the pick-up felt and then proceeded to set up the machine from the numerous small parts that had actually been cut to scale. First, the five 60-inch diameter cylinder molds were placed into position, and the five vats to suit. The vats of the modernized machine were said to have been made of metal—cast iron ends and circles of copper. The whipper stand was then located and was followed by the placing of the various rolls. Rubber covered rolls were in red, while brass rolls were gilded.

The felt, as it left the vat section, passed over a Downingtown extractor roll which in the model machine was placed into position along with two 24-inch primary suction press rolls, a 30-inch diameter suction first press, a suction second press a little larger than the first and a third press modernized from the third press of the old machine. Hydraulic lifts were shown to be used on each press.

With the wet end completed, Mr. Hyer proceeded to erect the dryer section, a section consisting of 126 vertical dryers, thirteen of which followed a size press.

The size press was said to have been made from one press of the old machine. The top roll was of brass, while the bottom roll was rubber covered.

Not to be outdone by any erection engineer Mr. Hyer then placed ladders in position along the dryer section, arranged walkways where necessary, built up two calender stacks — the first of seven rolls, the second of nine, and then placed the reel into position with its jumbo roll of paper already wound upon it.

As a grand finale, two miniature men, one representing Roy Kelly of Marathon Paper Mills, and the other, Frank Timmerman of Northern, were then set into position to run it.

This presentation was very novel and was extremely interesting.

A subject that has commanded more or less attention by the industry for many years, but particularly during the past few years, was next covered in a paper entitled, "New and Future Uses of Paper." This paper presented by Edward T. A. Coughlin, reviewed some of the recent developments and mentioned several possible future trends. New sulphite bond papers entering an overcrowded market, and being merchan-

dised successfully, was cited by Mr. Coughlin as a new use for paper since the papers have been able to obtain recognition. The possibility of producing a transparent paper equal in quality to film stock now produced from cellulose esters was suggested to Mr. Coughlin by one of the country's foremost research engineers who also was of the opinion that provision might be made to reinforce and weatherproof it so that a flexible glass might be produced and marketed. Another correspondent predicted that paper will enter fields which are now occupied solely by textile fabrics; that a market awaits the introduction of a suitable wash cloth, dusters, and the like; that good progress has already been made in the field of leather substitutes; that various combinations of textile and paper products will result; and that it is very likely that liquids will be transported in paper sacks of suitable construction.

Reference was made to the production of opaque papers and to the use of paper bottles for the distribution of nationally advertised motor oils, paper cartons for four, eight, and sixteen pounds of lard, paper for jig-saw puzzles, paper for use in conjunction with radio advertising, paper containers for the transportation of beer, laminated paper board for radio sets, and match board for paper matches. It was also suggested that kapok fiber for use as an insulating material was being produced on a fourdrinier machine.

Paper rugs, paper curtains, towels, face tissues, napkins, cups, plates, table covers, waxed paper and tissues for food wraps were among the paper products mentioned as being found in most households. Among the suggestions offered for new uses to satisfy family needs were: Ten-cent paper umbrellas, black kraft paper overshoes, waterproof paper ponchos, paper vests furnishing warmth, and a paper envelope covering for milady's bonnet to protect it from the rain.

A picture was also painted covering the future of paper wall-boards, laminated papers, bleached kraft papers, and the like. Auto tires and auto bodies made of paper or fibrous molded material were suggested as future items for consideration.

"The Windowless Paper Mill" was the title of the paper presented at the close of the first morning's session by A. E. Montgomery, of the J. O. Ross Engineering Corporation. In this paper Mr. Montgomery explained the reasons behind the building of the windowless mill by the Blandin Paper Co., Grand Rapids, Minn., described the new construction, and made some very interesting statements concerning the results obtained. The reasons given for the windowless construction were uniform lighting and the uniform handling of air for ventilation at all times.

The new construction comprised an addition to an existing two-machine mill. A new finishing room building and train shed were built onto the old finishing room and connecting to a new machine room and machine room basement. The finishing room building was 128 feet long by 80 feet wide, exclusive of train shed, and was designed to afford space for finishing, storage, shops, and store room. The new machine room and machine room basement was built to house one machine and approximated 320 feet in length and 50 feet in width. Hollow tile and brick veneer were used for the walls while wood was used for the roof. The exterior walls were paneled with brick of several colors to present a pleasing architectural appearance. Mercury vapor lamps, General Electric Cooper-Hewitt units having Uviol tubes, were installed for lighting the interior.

This construction, together with the installation of the ventilating equip-

Herbert T. Randall
The Association's new president

ment, has enabled the new machine room to be heated and ventilated with an unusually low supply air temperature. Except in the most extremely cold weather all heating in the new paper machine room, paper machine room basement, old finishing room, three floors of the new finishing room, and a portion of the wet end of the old machine room is accomplished entirely with heat recovered from the Briner economizers. Another interesting result of this construction, according to Mr. Montgomery, is that temperature within the mill does not change materially over the week-end shut-down, and for the same reason does not change with outside temperature conditions as rapidly as in the ordinary mill. He also expressed the opinion that further windowless mills may be expected now that precedent has been broken.

At the joint luncheon which followed the presentation of Mr. Montgomery's paper, Frank P. Vaughan of Bay West Paper Co., Green Bay, Wis., acting as toastmaster, introduced Edward F. Flynn of the Great Northern Railway after several old-time songs had been sung. Mr. Flynn talked upon the subject of "Transportation." Speaking with the rapidity of machine gun firing he not only gave an inspirational address, but also presented numerous facts and figures relative to the railroad situation and the tax problems of the country.

This luncheon program was completed with the presentation of prizes to those who had taken part in the Olympic activities of the day before.

An extremely interesting paper on "The Properties of Paper Pigmented with Zinc Sulphide" was read by Howard M. Cyr, Chief of the Fundamental Pigment Section, Research Division, The New Jersey Zinc Co., as the first paper of the afternoon session. His remarks for the most part were confined to results obtained from research activities, which were started over a year ago by The New Jersey Zinc Company at the Institute of Paper Chemistry in Appleton and which are still in progress both at the Institute and in the Research Laboratories of The New Jersey Zinc Company.

Mr. Cyr pointed out that a high refractive index and an optimum particle size were the two most important properties of a pigment being used to develop capacity in paper. The refractive index of zinc sulphide (the property of the pigment particle to bend back the light rays which strike it) was given as 2.37 as compared to 2.01 for zinc oxide 1.65 for barium sulphate, 1.56 for clay (kaolin), 1.56 for calcium carbonate, 1.55 for talc, 1.53 for paper (cellulose), 1.53 for gypsum, 1.52 for tung oil, 1.48 for linseed oil, and 1.48 for paraffin. The optimum particle size for such a pigment was said to be about 25 microns (.00001 in.).

It was discovered during the laboratory investigation and was later confirmed in commercial mills that zinc sulphide pigment sterilizes the paper furnish. Original sample jars from the laboratory experiments, now over a year old, show no evidence of decomposition or deterioration in those containing zinc sulphide pigments, whereas the control samples and those containing ordinary fillers deteriorated very rapidly during the warm summer months. Likewise, badly slimed equipment in commercial plant operation, when these pigments were used, has been completely cleaned within a few hours.

It has been found that zinc sulphide pigment is not thrown out of stock by stock cleaners of the centrifugal type; that it has a surprisingly small effect on the physical strength of paper; and that it causes papers with the one exception of 100 per cent rag content stock to resist degradation. Furthermore, the pigment operates to hide any yellow color generated in the paper fibers on ageing.

The incorporation of zinc sulphide pigment in the paper was said to offer no fundamental operating difficulties, since it may be added dry or in slurry form to the beater and disperses within a few minutes throughout the stock. Under very adverse conditions retention figures around 30 per cent have been experienced, while more favorable conditions result in 50 per cent to 75 per cent retention. One mill which has a nearly completely closed white water system is obtaining 95 per cent retention of the zinc sulphide pigment.

In concluding his remarks Mr. Cyr mentioned the value of these pigments

as coating agents, and suggested that in this field zinc oxide as well as the sulphide gave very satisfactory results.

Following the presentation of Mr. Cyr's paper, C. M. Baker, Engineer, American Paper and Pulp Association, was introduced by Mr. Brydges.

In his paper on "White Water Problems," using a blackboard to illustrate his talk, Mr. Baker briefly outlined six problems involving the utilization of white water from a fourdrinier, a Yankee, and a Harper fourdrinier when lapped stock was used; a cylinder machine when lapped or dry stock was used; a machine when supplied with slush stock; the use of white water in the pulp mill or in the preparation of stock; and the control of slime. The first four of the problems were explained through the use of diagrams so that the methods employed for handling them might be more easily understood. In discussing the use of white water in the pulp mill and in the preparation of the raw materials, Mr. Baker recommended, in general, that all white water should be reclaimed, returned and reused as near its source as possible; that the counter current method should be used in washing stock and fresh water supplied only where necessary to wash the finished product; that the dilution of stock before the deckers or thickeners should always be with white water; and that white water returned from the paper mill should be used to the fullest extent possible. He emphasized the fact in his last problem that slime control was absolutely necessary for successful white water utilization, and stated that the ammonia chlorine treatment had been found to be the most effective means of control.

Numerous contingent problems encountered through placing into effect the methods outlined in the several problems were presented as questions by Mr. Baker for joint consideration and discussion somewhat later at the convention. He wanted to know if it was possible to use bleach wash water to wash sulphite pulp in the blow pits, the effluent from deckers or Oliver washers for dilution before the decker or washer, paper machine white water to wash bleached pulp, colored white water from the machine in the pulp mill, wash water from the preparation of rags or other stock or to use white water in connection with all grades of paper. He also wished to know if the use of white water affected beating, sizing, quantity of foam, furnish, machine operation, quantity of dirt in stock, or quality of finished product. Several questions were also asked in regard to the use of white water showers.

In the next and last paper on the afternoon program of the first day, Chester P. Waite, Assistant Supervising Engineer, Travelers Insurance Co., told of the work that has been done to prevent accidents and stated that 88 per cent of the accidents were due to man failure. He placed the reason for man failure upon the attitude of management and disloyalty on the part of the workers. Improper leadership was said to be the cause of many mistakes or accidents, and the importance of having instructions understood and carried out was stressed. In the opinion of Mr. Waite, men who lack precision and do not have rapid control of muscular action by the eye or other senses repeatedly err and endanger every one about them. Work should be selected for such men where unexpected emergencies will not arise demanding rapid action and decision.

In concluding his remarks, Mr. Waite raised the question, "Wouldn't it be a good idea to set up a system whereby an accumulation of facts relative to causes of shutdowns on paper machines might be used to advantage in controlling men?".

Group Dinner Meeting

A group dinner meeting was held the same evening at the Beaumont Hotel where C. E. Jackson of Consolidated Water Power Paper Co. acted as toastmaster and J. G. Rosebush, General Manager of Northern Paper Mills, was the principal speaker. In a most scholarly and yet interesting fashion Mr. Rosebush dissected the word "Initiative," thus explaining its meaning, and briefly defined it as invention in the field of administration.

The foundation of sound initiative, said Mr. Rosebush, is profound study. He cited several references to situations during the Civil War where initiative was sadly lacking, causing failure, or where it was present with resulting victory, and briefly outlined five rules for successful attainment: namely, Deal only with trustworthy men; avoid having a great many contacts with individuals that always seem unlucky; stress dealings with men of skill and training; try untried plans grudgingly; and see that any plan decided upon forms a part of a well-formulated plan of action.

The several group meetings (book and fine paper, tissue, board and coarse paper, groundwood, soda-sulphate, and sulphite) were held following the dinner meeting.

Book and Fine Paper Group

Two papers were presented before the book and fine paper group meeting of which Charles Champion was chairman.

The use of rosin wax to improve the quality and to increase the uses of paper was the subject of the first paper and was presented by Charles R. Outterson of Bennetts, Inc. After demonstrating the solubility in cold water of rosin wax samples, containing 19 per cent, 38 per cent, 52 per cent, and 80 per cent of wax respectively, he explained that wax imparted greater smoothness and better printing qualities to a sheet and at the same time gave more pliability, a higher degree of sizing, greater resistance to alkalies and alcohol, and greater resistance to shrinkage, expansion, and curling.

Paper sized with rosin wax, citing several examples, was said to resist discoloration and fading better, and at the same time was softer and more pliable than similar grades sized in the ordinary manner. It was mentioned further that in papers which require good pliability that the number of folds they will stand was not as important as their appearance after a single folding. The waterproofing, folding, and selective penetration characteristics of papers sized with rosin wax were also stressed.

Other interesting characteristics of rosin wax size, as explained by Mr. Outterson, included the fact that sizing might be accomplished when the stock on the machine was actually alkaline, and that coated paper sized with rosin wax to prevent penetration of the coating material remained pliable after coating.

The second paper before this group was presented by Herbert T. Randall on "Fourdrinier Shakes and Formation." Mr. Randall briefly outlined the history of the shake, starting with the St. Leger-Didot and Donkin machines and continuing through the first recorded vertical column shake. The first drawings of this shake were said to date back to about 1860. It was built at that time by Smith and Winchester, and by Merrill & Houston Iron Works, now the Beloit Iron Works. Due to increased speeds of machines and use of freer woodpulps, this shake was replaced in 1890 by a low vertical shake. The low vertical shake, proving satisfactory, was installed in many mills and hundreds of them were said to be still in use. Around 1900, Horne, Beloit, Black-Clawson, and Pusey & Jones were developing new adjustable fourdriniers. In 1901, Savery invented the new century shake of which 240 were built and all retaining the original features of design. In the same year, Horne was said to bring out the cable suspended type of fourdrinier, the first of which was installed in the Bayless plant and which is yet in operation. Over fifty of this type of fourdrinier were reported to have been built.

In 1904, Beloit Iron Works furnished the Rhinelander Paper Co. two adjustable fourdriniers, and in 1907 Eibel patented the high pitch fourdrinier. After much litigation, Eibel's patent was upheld by the Supreme Court. In 1915, Rice Barton & Fales built five machines for the Great Northern Paper Co. These machines, still in use, were equipped with removable fourdriniers, the removable part being removable in four sections by hand.

The first fourdrinier part removable as a whole through the use of power was said to have been built by the Beloit Iron Works for the Consolidated Water Power & Paper Co. and was not equipped with a shake. The first removable fourdrinier of this type equipped with a shake was built by Beloit for the Filer Fibre Co. in 1922 for the production of kraft papers. In 1924, Alonzo Aldrich received patents on the removable shaking fourdrinier part. Today, Beloit controls all the patents which they license to other machine builders to build fourdrinier parts under them.

The only foreign invention along this line that was worth mentioning, in the opinion of Mr. Randall, was the Voith high pressure inlet. In this regard, he expressed doubt as to whether Voith was

actually original in this work since Millard had done some early work in this country on the high head inlet.

Tissue Group

In the tissue group meeting, over which H. H. Harrison of Crystal Tissue Paper Co. presided, there was a discussion of the tissue machines around Green Bay together with a question box and the presentation of a paper by W. A. Chilson on "Paper Machine Variables" as a joint paper by P. K. Baird and himself, both of the staff of the Forest Products Laboratory. In this paper, it was pointed out that in spite of a wealth of empirical information available on the operation of the paper machine that the quantitative data available were exceedingly small.

Studies of the average commercial fourdrinier machine have resulted in the identification of some ninety variables, a few of the more important being: temperature, consistence, pH, relative speed of the stock going to the wire, shake, stock drainage rate, pressure applied to the wet sheet at various points, drying rate, pressure applied to the dry sheet in calendering and the draw between the various sections.

A controlled stuff and whitewater system has been developed, pneumatic pressure has been applied to the couch and pressure rolls and to the calenders, and a recording drawmeter has been developed and put into service.

Ultimately, the hope was expressed to have all of the essential processing conditions a matter of record and control, and so far as possible to convert the papermaking operation into an automatic process.

The discussion in this group meeting covered streaks caused by dryers, atmospheric wrinkles, blowing, and fuel consumption as well as of Mr. Chilson's paper.

Board and Coarse Paper Group

The board and coarse paper group meeting, with R. H. Kelly of Marathon Paper Mills as chairman, was opened with a paper by Arthur Murray, Insurance Department, Container Corporation of America on "Hazards of the Machine Room."

Mr. Murray first emphasized the fact that there were an unusually large number of different exposures to personal injuries in the machine room as compared to the other operations of a mill. He distinguished between thinking and habit, and summed up his approach to any accident hazard by stating that he was interested in ascertaining both the normal and emergency exposure of employees to injuries and the specifications for safe habits which will counteract the accident exposures without loss or injury to employee or property.

He cited numerous accident hazards and mentioned typical accidents at the wet end of cylinder machines, at paper carrying rolls, press rolls, felt carrying rolls, dryer section, calenders, reels and slitters, and rewinders. In discussing the variety of injuries at the reels and slitters, he listed seventeen typical injuries, while thirteen were listed covering calender injuries.

Mr. Murray recommended the use of safety shoes and said they would help to keep foot injuries at a minimum.

Numerous lantern slides were used to illustrate numerous hazards, and attention was focused for a time on the destruction wrought by dryer explosions.

At this meeting there was considerable discussion of the cylinder machine, which had been described at a previous meeting by Allen Hyer, and to which reference has already been made.

Groundwood Group

The groundwood group meeting, with R. H. Haddock of the Escanaba Paper Co. as chairman, listened to two papers. One of the papers was read by E. R. Durand, of the Blandin Paper Co., and the second by Leo Doty, of the Escanaba Paper Co. Both papers dealt with the production or manufacture of groundwood pulp. Mr. Doty, in his paper, reviewed some of the practices within the industry, told of the progress that has taken place within the past few years in grinding practice, gave suggestive recommendations for the purchase of pulpstones, and emphasized the need of proper dressing and sharpening of the stones. Only 15 per cent of a pulpstone was said to be worn away by actual grinding, while 85 per cent was wasted from the stone by dressing and sharpening.

Mill control, kinds of wood used for mechanical pulp, methods employed for grinding mixed woods, and factors governing the quality and production of groundwood were other subjects to which Mr. Doty made reference in his paper.

Soda-Sulphate Group

The soda-sulphate group, headed by George M. Trostel of Champion Fibre Co., listened to several papers.

One of these papers covered the results of some very interesting laboratory experiments designed to ascertain the influence of sulphidity on the physical and chemical characteristics of kraft pulp and was presented in the joint paper of Dr. Otto Kress and George H. McGregor, both of The Institute of Paper Chemistry. Spruce chips were used for each of the experiments, and all cooks were carried out under similar conditions of time, temperature, total alkali and unit weight of alkali. The only variable was the ratio of caustic soda to sodium sulphide. Conclusions drawn from this series of experiments indicated that under a given set of conditions for the cooking of kraft pulp increasing the sulphidity of the liquor results in a greater total yield although beyond certain fairly well defined limits the yield of pulp decreased and screenings increase, that longer cooking time at higher sulphidities does not serve to produce an acceptable pulp; that two parts of caustic to one of sodium sulphide plus or minus a normal variation in sulphidity, occasioned by minor variations in recovery operations, will produce an unbleached pulp of maximum yield of screenable stock of good strength and with screenings sufficiently softened so they can be reduced by mechanical means; that the color of the unbleached pulp produced by the two to one ratio was quite satisfactory; that the power consumption for a given hydration of a three to two ratio pulp was unduly large; that raw stock, fairly softly cooked, will require a more reasonable chlorine consumption at low shrinkage; that shrinkage by chlorination—hypochlorite bleaching is considerably greater than by single stage hypochlorite bleaching; that physical tests are markedly affected by the ratio of caustic to sulphide and by the method of purification; and that chemical tests appear to offer a little indication of the physical qualities of pulp produced under these conditions.

Another paper, by B. D. Milledge, Manager, Howard Smith Paper Mills, Ltd., touched upon the operation of the Cottrell precipitator, while C. L. Durkee of D. J. Murray Manufacturing Co. presented some data on the earliest types of sulphate and soda waste heat recovery units and the developments which lead up to the design of the latest type of Murray-Waern waste heat recovery system. A description of its features and its advantages were mentioned by Mr. Durkee.

A fourth paper, "The Influence of Chemical Concentration in the Alkali Pulping Processes," was read by M. W. Bray as a joint contribution by Dr. C. E. Curran and himself, both of the staff of the Forest Products Laboratory.

In this study, it was shown that increasing the concentration of chemicals in the cooking liquor materially increased the rate of delignification, and also effected a more rapid decomposition of the cellulose and alpha-cellulose content of the pulps obtained during the pulping operation. Furthermore, for the production of kraft pulps of high strength and yield, concentration showed but little influence with the possible exception of the percentage of screenings obtained. Less screenings were obtained as the concentration of chemicals was decreased. In addition, where an excess of chemical was present, necessary for the production of bleachable sulphate pulps, low concentration of chemical in the cooking solution was shown to be beneficial for the conservation of strength and bleaching agent for pulps cooked to a given yield.

Sulphite Group

Three papers were presented before the sulphite pulp meeting, over which S. E. Tomczak of the Flambeau Paper Co. presided.

One of these papers, "Relation of Yield and Quality of Sulphite Pulps to the Wood Species Employed," was presented by Dr. C. E. Curran, of the Forest Products Laboratory. Dr. Curran explained that the laboratory had compiled figures on the physical characteristics of a number of American pulpwoods. Yield differences of different species were said to be readily explainable both on the weight of wood per cord and on its chemical composition. A comparison of white spruce and eastern hemlock

showed a cord of the latter species to not only weigh 200 to 300 pounds less than spruce, but also to contain less cellulose and more lignin per unit of weight, thus requiring more drastic pulping action in reaching a desirable degree of purity. Western hemlock, on the other hand, closely resembled white spruce chemically and weighed 12 to 15 per cent more per cord. These differences were, therefore, reflected in both yield and quality of the pulps resulting.

Variations in the weight per cord and quality of pulpwood within the same species were said to explain the variable results obtained by different mills even though using wood of the same kind. Such differences, related to conditions of growth and storage, should in the opinion of Dr. Curran be taken into consideration in controlling woodroom operations in a sulphite mill.

Improving the quality and manufacturing processes of bleached sulphite pulp was the subject covered by John R. Rue in a joint paper by James S. Sconce, and himself, both of Hooker Electrochemical Co. Reference was made to a previous paper by the authors on "Direct Chlorination as an Aid in the Bleaching of Sulphate Pulp," and it was pointed out that the behavior of chlorine with sulphite differs in many ways from its behavior with sulphate.

The history covering methods of applying chlorine to pulp was reviewed, and factors affecting the chlorination procedure discussed. These factors included consistency, temperature, period of reaction, acid vs. alkaline pulp for washing, period of alkaline reaction and proportion of chlorine to pulp. Some emphasis was also placed on chlorine hypochlorite vs. single-stage hypochlorite bleaching and on modifications in the cooking operation. In conclusion, it was stated that bleaching practice could be modified to advantage by the introduction of a prechlorination treatment and that there would result either a saving in chlorine and lime or an improvement in the quality of the bleached pulp, or both.

The third paper was read by Mr. Tomczak to create interest in an open discussion on more recent modifications in sulphite cooking methods. The most recent modification in sulphite cooking was said to be forced circulation and indirect heating. Some of the benefits claimed for this modification included elimination of local overheating; temperature uniformity throughout the digester; uniform and better grade of pulp; cooking process simplified; higher yields, less screenings; saving in steam, sulphur, limestone and chlorine; and increased capacity of digester through use of chip packer.

The group meetings concluded the formal part of the first day's program which certainly proved to be varied and profitable.

Friday Sessions

On the morning of June 9, the convention was called to order by Mr. Brydges who immediately introduced F. D. Bowman of the Carborundum Co. Mr. Bowman described briefly how abrasives and abrasive products were made and then proceeded to show three extremely interesting moving picture films in which Dr. Acheson re-enacted his early work in developing carborundum. The present manufacturing process for producing it, and the production of the carborundum pulpstone were also illustrated.

Following the showing of these films, R. H. Smith, of the Reliance Electric & Engr. Co., was called upon to present his paper which he did with the help of lantern slides to permit better appreciation of the subject matter. The advantages gained by adopting to paper mill requirements a constant tension regulator of the rotative element type for controlling tension on reels and unwinding stands was the subject covered by him.

The shortcomings of the conventional mechanical arrangements for doing this work were first expounded and emphasis was placed upon the attentiveness and judgment required by operators to handle such equipment. He then proceeded to describe how a tension regulator with electric drives was applied in similar service following which he described typical backstand tension equipment for a 244-inch four-drum winder. A complete electric drive for winding paper on reels or shaft winders was said to consist of an adjustable speed direct current motor connected to the roll shaft; a tension regulator; an operator's panel with rheostat, ammeter and push buttons; a controller; and a source of direct current. The adjustable speed motor must have a range of shunt field speed variation sufficient to cover the ratio of the diameter of full roll to diameter of empty core, while the selection of tensions for different weights and grades would be controlled through the rheostat. With this equipment, the motor at the start of winding a new roll accelerates the roll shaft and the regulator assumes control of the motor reducing its speed at the roll builds up and at the same time governing the current drawn by the motor according to the tension setting selected by the operator.

The electrical equipment for an unwinding stand was stated to consist of a direct current generator with shunt fields; a tension regulator; an operator's panel with rheostat, ammeter and push buttons; a controller; and a circuit to absorb the direct current power developed by the generator. The generator, mechanically connected to the shaft of the unwinding stand, develops voltage as it rotates due to the paper being unwound. By being connected to a circuit on which that voltage can be impressed and cause current to flow, energy is absorbed and that energy is produced by the resulting tension in the web of paper which causes the generator to revolve. The regulator functions as a governor to throttle the energy developed to correspond to the operator's selection of tension. As the roll unwinds and its shaft rotates faster and faster, the regulator weakens the shunt field of the generator, keeping the voltage produced at a constant value.

Two other papers were presented during the morning session of the second day. One of them, presented by J. E. Underwood, covered a joint paper prepared by C. F. Weitzel and himself, both of Pennsylvania Salt Mfg. Co., on "The Introduction of Elemental Chlorine in the Bleaching of Pulp." This development, according to Mr. Underwood, paralleled the development of new materials for use for corrosion resistance purposes. Through the use of an ejector it was found that water might be oversaturated with chlorine—chlorine being present as a dispersed phase of the gas. An experimental installation utilizing the ejector principle was installed in the plant of the Badger Paper Mills, Inc. Two ejector pipes in this installation were led into the Bellmers and water was supplied to them at 25 or 30 pounds pressure together with chlorine from chlorine cylinders. This installation showed promise, and an installation was later made in the plant of the Marathon Paper Mills Co. Lantern slides were used to illustrate the system and to show the work done.

Two-stage bleaching in Bellmers was then briefly discussed by John Hansen of Badger Paper Mills, Inc. He explained the reason for the use of the system just previously described by Mr. Underwood, illustrated some of the features of the installation through the use of lantern slides, and claimed a saving of 30 to 35 per cent chlorine and a saving on lime over their previous system.

At the noon luncheon, J. M. Conway, general manager, Hoberg Paper & Fibre Co., was introduced by A. D. Murphy, of the Green Bay Association of Commerce, to speak on "Your Duties and Mine." Mr. Conway implored the use of group thinking, and requested that leaders in all lines of business back up the programs of their state and national leaders and devote some of their time to the study of political problems. The conditions of today were said by Mr. Conway to be due largely to the refusal of leaders to lead further than their own doorsteps.

Mr. Bowman of the Carborundum Co. was also called on for remarks. He mentioned briefly his association with the Superintendents Association and asked permission, which was later granted in, the business program, to dedicate a program this coming fall (if he is again permitted to go on the air with the Carborundum Band) to the officers and men who comprise the membership of the American Pulp and Paper Mill Superintendents Association.

During the afternoon session of June 9, A. F. Francis, of the Chromium Corporation of America, presented a brief paper on the benefits of chromium to the paper industry. The paper was confined to the benefits derived from the chromium plating of both pulp mill and paper mill screen plates.

New Officers

The remainder of the afternoon session was devoted for the most part to the discussion of papers previously presented, particularly to the paper presented by Mr. Baker on white water problems, and to the election of officers.

The new officers elected include: Her-

bert T. Randall, president; K. E. Terry, first vice-president; Charles Champion, second vice-president; Frank J. Timmerman, third vice-president; Michael Redmond, fourth vice-president, and George M. Trotsel, fifth vice-president.

Banquet Meeting

At the banquet that evening, held in the Crystal Ball Room at the Northland where the previous meetings of the day had been held, was presented some very enjoyable entertainment which included several solos by Miss Lucille Meuselle, soprano of the Royal Opera, Liege, Belgium. She was accompanied at the piano by Mrs. John Whitney.

A prominent lawyer of Green Bay, Will L. Evans, acted as toastmaster, and James E. Gheen in the role of a papermaker from Ireland, with his ready wit and satire, together with his homely philosophy, gave everyone something about which to laugh and also something over which to ponder.

The past president's jewel was presented at this session by E. T. A. Coughlin, one of the early presidents of the association, to William Brydges, retiring president. He was also presented with the L. D. Post trophy by F. J. Rooney, also a past president.

The Eastwood golf cup was presented to Herbert Randall, incoming president, by William Brydges, and after a few remarks by F. C. Boyce of Wausau Paper Mills Co., and Frank J. Timmerman, general chairman of the convention, the meeting was adjourned with the singing of America.

The morning of June 10, the last day of the convention, was given over to visiting the pulp and paper mills of Green Bay, the Institute of Paper Chemistry at Appleton, and A Century of Progress in Chicago.

Exhibitors of Equipment

There were a number of equipment exhibits arranged to interest pulp and paper mill superintendents in addition to the formal program of papers. The following firms were listed among the exhibitors: Louis Allis Co., Milwaukee; Arabol Mfg. Co., New York; American Rolling Mill Co., Middletown, O.; Bailey Meter Co., Cleveland, O.; Cameron Machine Co., Brooklyn, N. Y.; Century Electric Co., St. Louis, Mo.; Chromium Corporation of America, New York City; Connersville Blower Co., Inc., Connersville, Ind.; Crane Co.. Chicago; DeLaval Steam Turbine Co., Trenton, N. J.; Dodge Manufacturing Corporation, Mishawaka, Ind.; Fafnir Bearing Co., New Britain, Conn.; Globe Stainless Tube Co., Milwaukee, Wis.; Hudson-Sharp Machine Co., Green Bay, Wis.; Leeds & Northrup Co., Philadelphia; Michigan Steel Castings Co., Detroit; Neenah Brass Co., Neenah, Wis.; Nelson Machine Co., Green Bay, Wis.; Parsons-Card Co., Milwaukee, Wis.; H. H. Robertson Co., Pittsburgh; Standard Oil Co. (Indiana), Chicago; Amiel Umberham Co., Green Bay, Wis.; and Wallace & Tiernan Co., Inc., Newark, N. J.

Surely, each of the exhibits indicated progress of the equipment industry to meet the needs of papermaking.

◆ Southeastern Supers Meet at Asheville

On Friday and Saturday, May 12 and 13, the Southeastern Division of the American Pulp and Paper Mill Superintendents Association met at the George Vanderbilt Hotel in Asheville, N. C. About seventy were in attendance.

After registration, the first day was principally taken up with a visit to the plant of American Enka Corp. at Enka, N. C., where the visitors watched the transformation of high alpha pulp into rayon.

On the evening of the first day, there was a stag dinner, at which R. B. Robertson, Jr., delivered a very interesting address in which he discussed the present economic situation and stressed the need for whole-hearted co-operation all the way from the sales force back to the forest. He said the salesmen must co-operate with the customer and the production men, and the latter must co-operate among themselves. He told briefly of the fine spirit of co-operation in the Champion organization fostered by the Foremen's Club. Finally, he emphasized the need for co-operation between the woodusing industries like woodpulp with the National Government in its forestry and stream conservation program.

The second day was given over to papers and discussions. The first paper of the morning session on "The Destiny of Sulfate," was given by R. H. Stevens. The speaker traced the rapid growth of this industry and showed how it has encroached upon the field of unbleached sulphite in the lower grades on a price basis and how there has been a shift from unbleached to bleached sulphite in the upper grades, thus placing unbleached sulphite between the "economic shears" that Trotzky talks about. Mr. Stevens predicted that the use of sulphate which already tops the list in tonnage, would grow to be the dominant class of chemical woodpulp and eventually would furnish the cheapest source of cellulose for the manufacture of fine chemicals derived from it.

The next speaker, F. A. Barber, took up the subject of printers' troubles and stressed the lack of contact between the paper mill and the printer. He was inclined to believe that the jobber was largely to blame for this.

F. V. Doubt gave a detailed account of the methods in use at the plant of the Champion Fibre Company for testing pulp and emphasized the need for standardization of pulp testing methods. During the discussion that followed Mr. Doubt's paper, the ideas of several speakers were co-ordinated into a suggestion that it might be advantageous for the Superintendents Association to co-operate with the T. A. P. P. I. Pulp Testing Committee. Mr. Brydges, the national president of the Superintendents Association, was present and promised to bring the matter to the attention of the Executive Committee at the Green Bay meeting.

A paper on the subject of "Rapid Growing Trees" was read by H. R. Murdock, who brought out some valuable points on the growing of trees in pulp making regions.

The convention closed with a dinner meeting on Saturday night at which R. W. Griffith spoke on economic problems and present conditions.

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◆ New Catalogues and Publications

Amthor Testing Instrument Co., Inc., Brooklyn—New literature from this company includes circular No. 106, describing the new automatic fixed reading tachometer for speed measurement of revolving equipment, and No. 107, descriptive of a new portable bursting strength tester, new tensile strength testers, a new pocket thickness gauge, all designed for rapid testing of materials such as paper product suplies, cordage, rubber, wire, etc.

General Electric Co., Schenectady, N. Y. —G-E Motors and Control for Pulp-refining Equipment is the subject of GEA 1710, a new bulletin just received. Another, No. GEA-1711 covers the subject of Synchronous Motors and Controls for Pulp Grinders.

Gootze Gasket & Packing Co., Inc., New Brunswick, N. J.—Of interest to any purchasing agent that is in the market for gaskets and washers, is the new folder just issued by this company describing and illustrating their many types of gaskets and washers. Samples, prices and other information gladly furnished.

E. F. Houghton & Co., Philadelphia—This company is distributing a 24" x 36" wall chart entitled "The Care of Leather Belt." Some of the subjects covered are: How and when to dress belting; Belt fastenings; how to lace a belt; how to put on a belt; tables showing the width of belt necessary for any drive; mechanical rules for figuring speeds, pulley ratios, etc. This chart will be sent free to plant engineers who address their request to the company at 240 W. Somerset Street.

McLeod & Henry Co., Troy, N. Y.—A new booklet has just been issued on "Steel Mixture" Oil brand fire brick and other refractory materials. A section of the booklet is also devoted to Carbex Refractories and general information on the company's products.

Mishawaka Industrial Instrument Mfg. Laboratory, Mishawaka, Ind.—A bulletin has been issued giving general information on this company's line of Pyrometers. These instruments are made in models for panel mounting, wall mounting, portable use and multiple point installations. The bulletin contains a price list and illustrations of the various models.

Taylor Forge & Pipe Wks., Chicago—This company has published in attractive booklet form a paper entitled "Design your Welded Piping" which was presented at a joint meeting of the New York section, American Welding Society and the Petroleum and Power Div., A. S. M. E., by F. S. G. Williams of the Taylor Forge & Pipe Wks.

BOOKS

Chemical Guide-Book—1933 is the ninth edition of this publication that has been developed as a reference work for those who buy, use, sell, or make chemicals. This edition includes an extensive buyers' guide and directory of chemical products arranged alphabetically with names and addresses of sources of supply, chemical and physical characteristics of each product, grades, containers, shipping regulations, tariff, etc., as well as a geographical directory of the chemical and allied industries including street addresses and telephone numbers. In addition, it contains a list of manufacturers and dealers that handle many of the varied types of containers employed in the chemical industry, some chemical statistics, and the names and addresses of the many trade associations affiliated with the chemical and allied fields. This book, published by Chemical Markets, 25 Spruce Street, New York City, is priced at $2.00 per copy.

◆ To Commemorate Paper Day at Exposition

September 1 will be "Paper Day" at A Century of Progress, Chicago. This occasion will be commemorated with special officially cacheted envelopes, wrapper style, bearing the new Century of Progress stamps and mailed from the exposition sub-station post-office. (Cacheted envelopes are those having a special design struck on the left hand side of the front, significant of the date and event to be commemorated.)

Lou W. Kreicker, 201 North Wells Street, Chicago, Cachet Director of A Century of Progress, states that these envelope-wrappers will be made of paper that is made at the exposition in the exhibit of the Paper Foundation on the small fourdrinier machine of the American Writing Paper Company.

These envelopes will be mailed as souvenirs, and it is understood there will be a service charge of fifteen cents for each cover mailed.

◆ Houghton Announces Promotions of Executives

The board of directors of E. F. Houghton and Company, Philadelphia, Pa., announces the following changes and promotions in executive personnel:

Louis E. Murphy, president since 1929, continues in that capacity.

Major A. E. Carpenter, first vice-president and treasurer, resigned the latter office and was elected general manager.

George W. Pressell, second vice-president and secretary, resigned the secretaryship and was elected assistant general manager and director of sales.

Dr. R. H. Patch, director of plants, has been elected treasurer.

A. E. Carpenter III, assistant to general sales manager, was elected secretary.

The board also announces the appointment of George S. Rogers, formerly assistant general sales manager in charge of the St. Louis and Chicago offices, as general sales manager with headquarters in Philadelphia.

Sales for the month of May, 1933, were reported the highest in over a year, being 24.5 per cent above those of the same month in 1932.

◆ Chromium Corp. Takes Over Patent for Suction Box Covers

U. S. patent No. 1,910,330 for chromium-plated suction box covers for paper-making machines has been issued to Edson R. Granger, assignor to Chromium Corporation of America.

Chromium-plated suction box covers are said to provide certain improvements not previously obtainable. Wire life has been increased materially: in some cases as much as 50 per cent. Felt life is lengthened about one-third. The characteristic smoothness of chromium reduces friction and largely eliminates clogging and consequent loss of suction efficiency. Plated covers have operated 18 months with no cleaning whatsoever. The unusually hard surface remains smooth and unscored for indefinite periods, and corrosion is eliminated. Higher operating speeds are made possible. Suction may be reduced 40 per cent or more without decreasing the amount of water removed. A reversible feature permits both chromium plated sides to be used. These advantages are claimed to result in an improved product at decreased cost.

◆ National Adhesives Corp. Expands

A new building exclusively for the manufacture of transparent cellulose glues, gums and cements has been erected by the National Adhesives Corp., New York, one of the largest producers of adhesives. The new building which also contains a complete experimental laboratory, adjoins the company's factory at Dunnellen, N. J.

According to A. D. Fuller, head of the company's manufacturing department, the new building was made necessary to obviate the necessity of working the former facilities overtime to meet the demand of incoming orders.

The company has recently developed new gums for sticking moisture-proof tissues for laminating cellulose tissues not only to themselves, but also to papers of various kinds.

The company's laboratories have developed several new gums and cements which have solved the problems of sealing moisture-proof and plain tissues both by hand and by machine.

◆ PITTSBURGH EQUITABLE Meter Co., Pittsburgh, announces that an agreement has been made with the Peacock Brothers, Limited, Montreal, whereby the latter will manufacture and sell the products of the Pittsburgh Company in Canada. For several years past, Peacock Brothers have manufactured and sold Nordstrom Lubricated Plug Valves under license from the Merco Nordstrom Valve Co., a subsidiary of the Pittsburgh Equitable Meter Co.

◆ Government Acts to Preserve Records

When the official records of the present history-making days of the Franklin D. Roosevelt administration are examined by future generations, whether one hundred or one thousand years from now, they will be in perfect state of preservation as a result of a system of air conditioning being installed in the new government Archives Building in Washington, D. C., by the York Ice Machinery Corporation of York, Penn. The building is now under construction. Installation of the air conditioning equipment has just begun.

All official documents, including presidential proclamations, presidential messages to Congress, original drafts of Acts of Congress, Constitutional amendments, Supreme Court decisions, and other executive, legislative and judicial records will be placed in the new building.

The air conditioning equipment is designed to create the correct atmosphere for the preservation of documents. In the summer months excessive moisture content of the air, destructive to paper tissue, will be removed and in the winter some moisture will be added to prevent drying out of the paper fibres from artificial heating of the building.

Deterioration of documents which has robbed the world of many valuable records of the achievements of the past, is chiefly the result of changing atmospheric conditions that come within the changing seasons, scientists state. In the new Archives Building a uniform atmosphere will be maintained throughout the year.

◆ Pfaltz & Bauer Appointed Reichert Agent

Pfaltz & Bauer, Inc., New York, have been appointed exclusive agents for the line of scientific instruments made by C. Reichert Optical Works, Vienna, Austria.

The Reichert line consists of biological, medical, petrographical and metallurgical microscopes and accessories, as well as projection photographic testing measuring instruments for industrial and research work.

New items being announced at present are a Micro-Metallograph, the Romeis Photo Micrographic Apparatus and the Fluorescence Microscope.

◆ IN ORDER TO protect its creditors and to assure continued operation of the plant, a court hearing of the affairs of the Norwood Engineering Co., Florence, Mass., on May 8, resulted in the appointment of Howard W. Hosford, general manager of the company, and G. Wilson MacDow, treasurer, as receivers.

◆ Competition for Development of Uses of Bone Glue

The International Association of Bone Glue Manufacturers, commonly called "Epidos" which gathers nearly all the European manufacturers of this commodity, has organized an international competition, which foresees 20,000 Swiss francs of prizes.

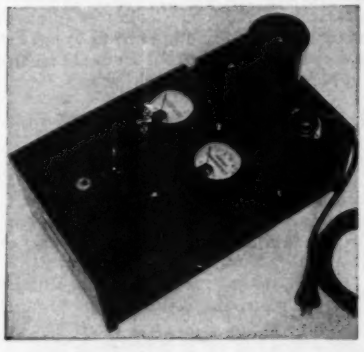
This competition is made to award these prizes to the chemists, technicians or inventors, authors of memoranda indicating: the results of research for the purpose of using bone glue in the manufacture of new products and products in the composition of which, hitherto, bone glue has not entered; or, the improvements in processes already using bone glue which will permit of the development of its use.

This competition which is open since the 1st of March 1933 and will close on the 28th of February 1934, is open to all those who may desire to take part in it. The competition is held under rules and organized by the Secretariat of the Epidos Glue Competition, 58, rue de Chateaudun, Paris, which will give all information requested.

◆ SMITH & WINCHESTER Mfg. Co., South Windham, Conn., designers and builders of paper mill machinery, recently shipped two special wet machines to be installed at the new mill of the Sterling Shoe Fibre Co., Eagleville, Conn.

◆ Paper Transparency Instrument

A simple portable instrument for registering the transparency of flat materials directly on a meter has been announced by Westinghouse Electric & Manufacturing Company. The unit, known as the Trans-O-Meter, is accurate, weighs only 8 pounds, operates



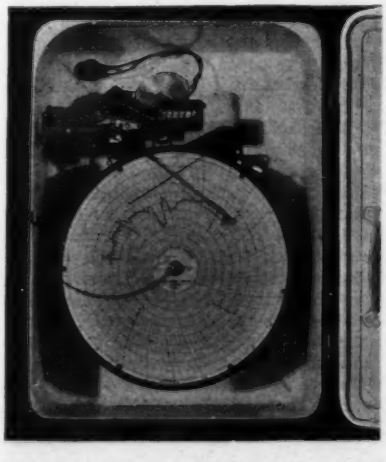
from 115-volt lamp socket and consumes only 200 watts.

With this instrument, only a few seconds' time is required to determine the transparency of paper with precision. Test samples of any size or length can be used; or if desired, a strip can be slowly drawn through the instrument, so that any variation in its transparency can be noted.

The simple principle of the Trans-O-Meter consists of measuring the amount of light a 25-watt lamp will pass through the sample. Light passing through the sample falls on a Photox cell which is connected to a sensitive mocroammeter calibrated to read "transparency" directly in percentage. The term "percentage transparency" designates the amount of light emerging from the material in comparison to the amount impinging upon it.

◆ Bailey Escapement Type Integrator

The most outstanding development incorporated in the new line of Bailey Fluid Meters, recently announced, is the escapement type integrator, which operates in an exceedingly simple but accurate manner. Total flow measured by the meter may be read from the six-unit counter of this integrator as easily as total miles can be read from an automobile mileage register.



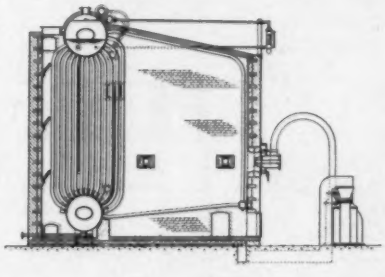
The integrator counter which may be calibrated to read in terms of gallons, pounds or other units is located behind a small window in the meter door so that it may be easily read without opening the meter casing.

The extreme accuracy of the escapement type integrator may be accounted for by the fact that the pawl engages and disengages during each cycle of the integrator, thereby adjusting the total flow to the prevailing rate of flow four times each minute instead of only once per minute as is customary in the ordinary type of periodic integrator.

◆ Steam Generating Unit for Small Plants

A steam generator unit of standard design and built in a range of sizes for capacities of 8,000 to 40,000 lbs. of steam per hour, has been announced by Combustion Engineering Corporation, New York.

The general character of the design is shown by the accompanying illustra-



tion. The unit comprises a two-drum vertical boiler and a furnace of solid brick walls, the top and front of which are water-cooled by tubes connecting into the upper boiler drum and terminating in a header in the lower front wall. A water screen across the furnace bottom connects this header with the lower boiler drum. Pulverized fuel is fired horizontally by a natural draft burner to which fuel is supplied by a Raymond Impact Pulverizer Mill, located either in front or to one side of the unit. The boiler can be arranged for either two or three gas passes and may be equipped with a superheater.

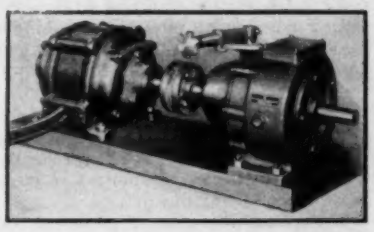
◆ Hot-Rolled Seamless Steel Boiler Tubes

Jones & Laughlin Steel Corporation of Pittsburgh has announced a complete line of hot rolled seamless steel boiler tubes which are said to have exceptional ductility and lend themselves readily to rolling in and beating operations.

In addition, the tube surfaces both inside and outside are unusually smooth. This characteristic, according to the manufacturer, tends to retard corrosion when the tubes are in use and minimizes depreciation while they are held in stock.

◆ Johnson Variable Reducer

A new variable reducer, designated as the Johnson variable reducer, has been announced by The Smith Power Transmission Co. of Cleveland, Ohio. The



unit has been designed to give infinite variable speed control from zero to any desired speed, and utilizes a control that is visible and quickly manipulated.

Several sizes in the lower power range, 1 to 10 hp., are to be manufactured as standard units. Larger sizes, up to 50 hp., will be manufactured on order.

◆ Rubber-Lined Valve

A new rubber-lined valve, known as the Vulcalock valve, has been announced by the B. F. Goodrich Rubber Company, Akron, Ohio. The new valve may be lined with any of the standard Goodrich Acidiseal rubber compounds, hard or soft, and is especially adaptable to fairly high pressure work and abrasive service.

Corrosive or abrasive materials passing through the valve come in contact only with rubber especially designed to resist their deteriorating action.

◆ Severe Duty Safety Switch

The Electric Controller & Mfg. Company, 2696 East 79th St., Cleveland, Ohio, is marketing a new Type A Safety Switch.

Although designed for the severe duty encountered in mill service, this safety switch is compact, small, nothing pro-

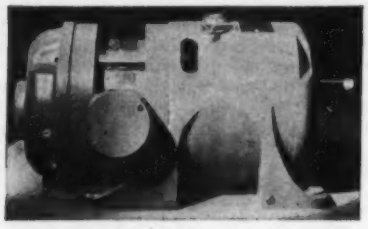
jects beyond the width of the box, and the cover swings vertically.

Outstanding features of this switch, according to the manufacturer, are semi-floating, double break V-blades, V-stationary contacts backed up with steel springs, individual barriers of arc resisting asbestos, all mounted on a single base which can be easily removed, when desired, by taking out only four screws.

◆ Reliance Gearmotors

The Reliance Electric & Engineering Co., of Cleveland, Ohio, has recently developed a line of gearmotors in sizes rated from ¾ hp. up.

These combine motor and speed re-

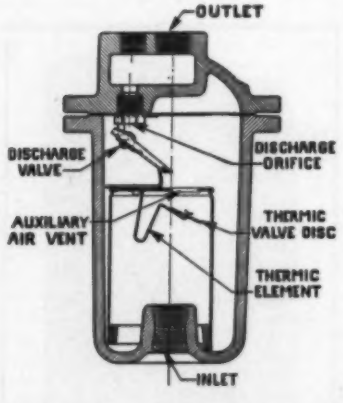


ducer into one compact, self-contained and fully protected unit which can be supplied for a wide range of ratios with both ac. and dc. motors of various types.

◆ Steam Trap with Thermostatically Controlled Bucket Vent

For quickly removing air from Morterud heaters, pipe coil radiation, paper machine dryers, etc., Armstrong Machine Works, Three Rivers, Mich., now offers a special trap bucket having a very large auxiliary air vent.

This vent is closed by a flat disc of stainless steel on the end of a strip of rustless thermostatic bi-metal which in turn is double riveted to the bucket cap. As long as the trap is cold, the disc is held away from the vent and air escapes



so rapidly that the bucket cannot float and close the discharge valve. Air blows through until steam fills the radiation and reaches the trap, causing the thermic strip to seat the disc which prevents steam from escaping through the auxiliary vent. Thereafter, the trap functions in the normal manner and any air that may be mixed with the steam will escape through the standard fixed vent.

◆ B & W Adds New Firebrick

B & W 80 Junior is the name given by the Babcock & Wilcox Company to a new firebrick that has been added to its line of refractory products. This firebrick has a melting point of 3,175 deg. Fahr., and its pyrometric cone equivalent is 33.

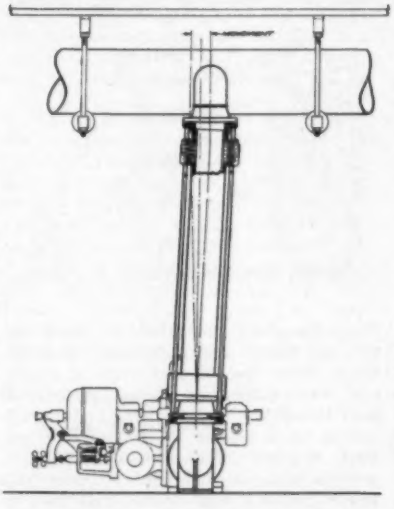
Engineers of the Babcock & Wilcox Company further state that B & W 80 Junior Firebrick has no free quartz in its composition, and that it is, therefore, unusually resistant to spalling.

For all practical purposes, the weight of the junior is the same as that of the B & W 80, or 7¾ pounds for a 9-inch straight brick.

◆ New Type Expansion Joint

The Croll-Reynolds Engineering Co., Inc., 17 John Street, New York City, has developed a new design of its FlexoDisc Alloy Steel Expansion Joint.

This design is useful for eliminating expansion strains in any case where lateral movement, as well as linear



expansion, must be handled without imposing any appreciable strains on the piping turbines or other equipment. The expansion elements are similar to the standard FlexoDisc joints using corrugated nickel steel plates fused together at their inner and outer edges by means of atomic hydrogen welding.

◆ Die Head for Old Pipe Machines

A new die head, No. 706, which can be installed on old pipe machines, has been brought out recently by Oster-Williams, Cleveland, Ohio.

The range of the new head covers all sizes of pipe from 1-in. to 6-in., and bolts from ¾-in. to 6-in. inclusive. Threading dies 5 to a set of high speed steel and of the small segmental type are mounted in holders of heavy and rigid hardened and ground steel to insure good support. The dies are held in the holders by a special socket holding screw. Cutting oil is pumped through the head to the threading dies.

The head is equipped with single high speed cutting blade mounted on a screw operated gibbed slide. The pipe is supported by a three-jaw universal centering guide when being cut off. The centering guide is bar operated and self-locking.

Reaming and chamfering of pipe is accomplished in one operation by means of a special forming tool mounted on the cut-off slide.

◆ Alundum Rubber Bonded Safety Treads

A new type of safety tread that is especially suitable for use in industrial plants and factories has just been placed on the market by Norton Company, of Worcester, Mass.

Designated as the Alundum Rubber Safety Tread, the new Norton product is composed of Alundum aggregate securely bonded in a reinforced base of hard, tough rubber. The tread surface, highly non-slip—even at the very nosing edge, is reported to be resistant to wear. It is claimed further that the tread is not affected by weather conditions, and its non-slip effectiveness is not lessened by water. Thus it is suitable for use in exposed locations out of doors as well as indoors where manufacturing processes cause wet floors.

The tread is supplied in units of various lengths and widths and can be placed directly over old wood, steel, concrete or stone steps.

❖ ❖ ❖

◆ Simplified Practice Recommendation on Paper Cones, Tubes

Simplified Practice Recommendation No. R143-33 covering paper cones and tubes (for textile winding) is now available in printed form, and copies can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents each.

This simplification program, proposed and developed by the industry, is concerned with the length, inside diameter; weight per thousand, and color of paper cones and parallel tubes.

These cones and tubes are used for winding textile materials, such as warp and knitting yarns, silk, rayon, hosiery yarns, tire cord, thread packages, and wire insulating yarns.

◆ AN ENTIRELY NEW method of making paper napkins, towels and table cloths has been perfected at the Grycksbo paper mill, in central Sweden, after two years of research. The plant now turns out two tons a day of the new product, which is covered by patents. What makes the article distinctly different from anything previously produced along these lines is the smooth, damask-like quality of the material. The manufacturing process is secret, but it is learned that cellulose cotton is used in the making, and that this cotton is impregnated with a certain fluid.

POWER

GENERATION + UTILIZATION + MAINTENANCE

This section turns the searchlight on power and its allied problems, showing big possibilities to save. Opportunities to improve conditions, methods, apparatus will be discovered. Worth while practices suggest new ideas and wider usages of equipment.

By W. S. JOULE

◆ Hazards of Electric Cords

For a number of years the writer of this article worked as an electrician where the hazards of high voltage were a regular part of the job. During those years, the only fatality of a member of the electrical gang was the result of a defective lamp cord on a job in a wet tunnel.

Portable electric lamp cords are dangerous for several reasons. The insulation becomes frayed, so exposing the person handling the cord to the live circuit. Around boiler rooms and power plants, even a low voltage may have a fatal effect because of the large amount of moisture, water and vapor present. All water pipes make a very low-resistance ground, so that maximum current will flow with minimum voltage. Expressed differently, the effect of low-voltage circuits would probably be extremely severe around boiler rooms, due to the large amount of metal which is well grounded. Ashes, incidentally, usually constitute low-resistant ground, particularly when they are kept damp.

Portable electric lamp cords are used around the boiler rooms for inspection and repairs. They may be used while scraping scale, removing soot, replacing tubes, repairing furnace refractories, taking down or replacing engines, etc. Because the men are working hard, often in hot localities, they perspire. The hands are grimy with grit and dirt. Because sweat and dirt constitute a relatively good conductor of electricity, 110 volts may result in a heavy flow of current when the damp hands hold a defective portable cord and the feet are in contact with ashes, steel work, water pipes and other good grounds.

What is true of the portable electric lamp cord is equally true of portable electric drilling machines and other electric tools . . . in fact, wherever a portable insulated electric cord is employed. Where this type of equipment must be used, special care should be exercised that the cord is maintained in first class condition, that insulation is maintained and bare spots taped up. Lamp sockets should be frequently inspected and maintained in first-class condition. Where lamp guards are used (and they are always advisable) they should preferably be built of insulating material. All metallic parts should be enclosed, including the lamp sockets.

◆ Using Steam to Break Up Clinkers

Clinker crusts and masses will sometimes build up to the full width of the furnace until the mass is too unwieldy to handle until broken up. Under such circumstances, clinker can be broken up without discomfort or danger to the fireman and without disturbing the fuel bed. A hand lance of sufficient length to pass the full width or length of the furnace should be constructed.

This lance, of one-half or three-quarter-inch pipe, should be open at one end while the other end should be connected to the steam supply. The lance should then be inserted into the furnace through one of the side doors. The steam should then be turned on while moving the open end or nozzle over the lump of clinker where it is desired to separate it. The steam will quickly cut the clinker, which can then be easily parted along the path taken by the steam.

◆ Effect of Water in Mixing Concrete

While the power plant engineer is not primarily interested in the technique of designing concrete mixes, he is confronted from time to time with problems which demand some knowledge of this field for their successful solution. The relation between the volume of water to the average compressive strength of the resulting concrete using average material is as follows:

Approx. compressive strength of concrete at 28 days. Lb. per sq. in.	Mixing Water, U. S. gal. per sack (cu. ft.) of cement
3800	5
3400	5½
3000	6
2600	6½
2300	7

The above figures show that each additional one-half gallon of water decreases the strength of the concrete from 300 to 400 pounds per square inch.

When the sand, crushed rock, or pebbles used in mixing the concrete are damp, the entrained moisture should be considered a part of the mixing water; and a deduction must be made for it, if concrete of a specific strength is desired. For example: If a concrete having a compressive strength of 3,000 pounds per square inch is needed, and the sand used is moderately wet, or contains about one-half gallon per cubic foot of this material are mixed with each sack of cement, only five gallons of water should be used to secure concrete of this strength since the sand contains the other gallon.

There is another advantage of using a small amount of mixing water besides that of producing concrete with a high compressive strength. It is that, when a plastic mix is secured, the structure will be more watertight, because of the formation of a less porous concrete. The amount of mixing water used is inversely proportional to the strength of the concrete, and directly proportional to its porosity.

The question of how much water to use may, therefore, be an important one. While it is true that concrete does not require to be handled very carefully, and requires little skill to mix or pour it or even to build the forms to receive it, it is absolutely necessary that the amount of water and the proportion of sand and pebbles used be properly proportioned. It is also very important that the sand be clean and free from vegetation and other foreign matter.

◆ Priming of Boilers May be Seasonal

At certain times of the year some plants suffer from severe priming or foaming. Seasonal conditions are a contribution cause, perhaps the major cause. Under these circumstances, suspicion should be immediately centered upon the boiler water. Is the water particularly dirty at these times? Does it carry matter in suspension—vegetation or oil? What is the relationship between the water and the load at these times?

Anything tending to retard the free separation of the steam from the water will tend to cause foaming. If the water is treated, excessive use of soda ash or compound may be the cause. A surface blow will help remove matter in suspension, while the blow down will help lessen concentration. Both should be tried and the result of each singly and jointly noted.

The fact that the trouble is seasonal suggests water trouble, although there is the possibility that restricted boiler liberation surface may occur due to the need for cleaning. High evaporation rates may be solely or partly to blame.

It is well to bear in mind that foaming and priming are merely the consequences and not the cause, so that the solution lies in finding the cause. This may be done by cut and try methods, but the best way is to study the load, and to analyze the water before and after it enters the boiler, and while both hot and cold. Heavy loads, long spells without cleaning boiler water surfaces, water heavy in suspended matter or excessive treatment may all be the contributing causes.

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will be paid to the person supplying me or the local police, with the first information leading to a successful prosecution of any person or firm manufacturing paper outside the Irish Free State, bearing the watermarked words:

"GUARANTEED SWIFT BROOK PAPER MADE IN IRISH FREE STATE"

Philip O'Reilly,
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1 Upper Ormond Quay,
Dublin, I. F. S.

The Paper Foundation Holds Dedication Ceremonies

"Paper's Century of Progress" is the theme of the exhibit of The Paper Foundation at A Century of Progress Exposition. These words appear in large letters above the entrance to the exhibition which is located in the Graphic Arts Division of the General Exhibits Building.

At five o'clock on the afternoon of June 1, a large and representative gathering assembled for the formal dedication ceremonies of this exhibit. Phil A. Howard, president of the organization, gave a short address in which he brought out the vital importance of paper to the world's progress over the past hundred years. Without paper, he said, there could be no progress. In explaining the exhibit to the audience, Mr. Howard stated that the thought behind all of the arrangements had been to "make the country paper-conscious."

Sincere appreciation was voiced by Mr. Howard for the co-operation and support of the directors of The Paper Foundation, the exhibitors, the Salesmen's Association, The American Paper & Pulp Association, the Writing Paper Manufacturers Association, the Western Paper Merchants Association, the Chicago Wrapping Paper Association, and the Institute of Paper Chemistry.

At the close of his remarks, Mr. Howard introduced Mrs. H. Gillette, who cut the bright ribbons stretched across the entrance and with a few well-chosen words invited the visitors to inspect the exhibition.

The miniature fourdrinier paper machine, loaned to the exhibit by the American Writing Paper Company, was already in operation with students from the Institute of Paper Chemistry in attendance. Back of this machine hung a huge picture of the largest paper machine yet to be built—the Bagley & Sewall machine in the mill of the Great Lakes Paper Company at Fort William, Ont., which makes a sheet of paper 304 inches wide.

From these modern methods, the visitor turned aside to witness the making of paper by hand with the type of equipment used in the 17th century. This equipment was loaned by the Institute of Paper Chemistry, and the work was demonstrated by students from that institution.

Along the entire length of the exhibit are attractive glass showcase units. Here the paper companies participating in the exhibition have displayed some of their products. This display will unquestionably make the public "paper conscious." It will cause the visitor to thoughtfully consider the many uses of paper that affect his daily existence. It will create within his mind questions as to the source and manufacturing processes of these useful and convenient products that have heretofore been accepted without much thought.

The Paper House, made entirely of paperboard, even to the fireplace, drew the interest of many. Here one sat in beautiful fiber chairs and divans; soft lights shone through parchment lamp shades. In the dining room a dark-haired little girl dressed in paper, was busily engaged in putting the finishing touches to an attractive tea table; the kitchen displayed many conveniences for the housewife that had their origin in a paper mill laboratory; the porcelain fixtures that have transformed the modern kitchen into a place of beauty and convenience were loaned by the General Electric Co.

Among the paper companies that have thus far contracted for exhibition space and participation are the following: American Writing Paper Co., Albemarle Paper Mfg. Co., Aetna Paper Co., Bird & Son, Inc., Bayless Pulp & Paper Corp., Crystal Tissue Co., Dennison Mfg. Co., Fort Howard Paper Co., Fox River Paper Co., Gilbert Paper Co., Hammermill Paper Co., Howard Paper Co., Hoberg Paper & Fibre Co., Hart Co., John M., International Paper Co., Keyes Fibre Co., Kimberly-Clark Corp., Leader Card Works, Marathon Paper Mills Co., Maxwell Paper Co., Menasha Paper Corp., Mid-States Gummed Paper Co., Miami Valley Coated Paper Co., Mosinee Paper Mills, Neenah Paper Co., Paterson Parchment Paper Co. and Union Bag and Paper Corp.

Since the exposition was officially opened, several more companies have expressed an intention to participate in this outstanding event, and the officers of The Paper Foundation have an expectancy that other names will be added to the above list of exhibitors.

RHOADS TANNATE LEATHER BELTING

for economy and dependability

RHOADS TANNATE WATERSHED BELT has demonstrated its ability to **reduce annual costs** on many hard paper mill drives. Running as paper mill belts do, in a moist, steamy atmosphere, sometimes splashed with water itself, pulling heavy loads for long periods, the belt which can stand up under the hardest paper mill conditions is a superior belt.

A Master Mechanic in a paper mill said of Rhoads Tannate Belts:

"Those are the best we have ever had. Your belts are fine. They run slacker and still they don't slip."

The Mill Manager in the same plant said:

"All the men report favorably about your belts. They are doing the job the way you said they would."

Tannate Belts are sold under the Rhoads Service Guarantee. It leaves you to be the judge of whether your purchase is profitable.

We shall be glad to send you a belt on this basis—or have a representative call to discuss your power transmission problems, especially the use of modern group drives.

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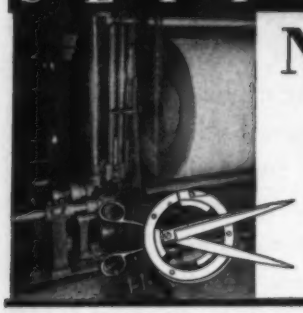
LANGSTON SLITTERS



NOTED for producing firm, tightly wound rolls with straight, dust-free edges, Langston Slitters combine high-quality production with low operating costs.

Samuel M. Langston Co., Camden, N.J.

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Precise Recording saves money...

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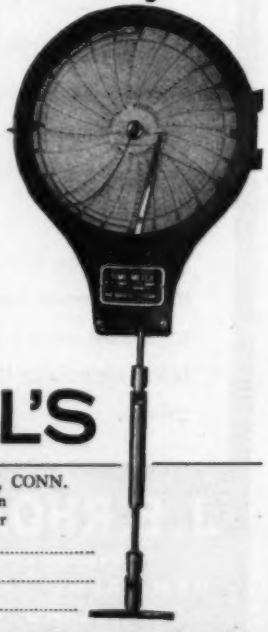

UNCANNILY accurate as the judgment of a skilled beater man may appear—it falls far below the precision of a Bristol Motion Recorder.

To obtain maximum capacity, to assure high quality the distance between beater roll and bed plate must be correctly maintained for each period. This is only possible with the aid of an instrument that relentlessly records the exact distance at all times.

With a Bristol Recorder one paper mill increased beater capacity 100 per cent, and saved $8,000 a year. Want to know more? Then please use the coupon below.

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Please send Bulletin 368-P on
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Application in which interested.....

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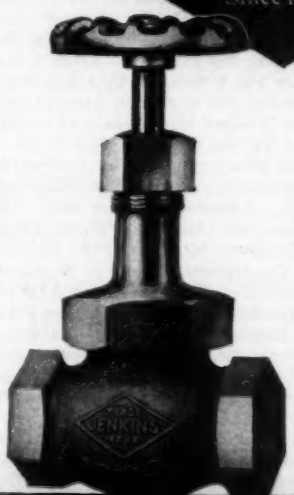
BRONZE IRON STEEL
VALVES
Since 1864



THERE is QUALITY in Fig. 106-A Jenkins Bronze Globe Valve—extra deep stuffing box—slip-on, stay-on disc holder — one-piece screw-over bonnet—Jenkins disc. It pays to insist on Jenkins Valves and the extra service that has characterized Jenkins quality since 1864.

JENKINS BROS.
80 White Street, New York, N. Y.
Bridgeport, Conn. Boston, Mass.
Chicago, Ill. Philadelphia, Pa.

Fig. 106-A Globe, Screwed

Obtainable through your supply house

◆ N. I. A. A. Program for Marketing Conference

Industrial advertising and sales executives in all fields will find much of interest in the program announced for the eleventh annual convention of the National Industrial Advertisers Association at The Medinah Athletic Club, Chicago, June 26 to 27. Tied in with the Century of Progress Exposition and Engineering Week this industrial marketing conference marks the high point of 1933 in a practical discussion of industrial sales problems.

As shown by the following program a wide variety of subjects will be discussed by outstanding leaders in various fields:

"Industrial Advertising and Its Opportunities in Today's and Tomorrow's Markets," by W. L. Rickard, president, Rickard & Co.

"How We Operate Our Advertising Department in Connection With Our Personal Selling To Industry," by General Thomas S. Hammond, president Whiting Corp., president, Illinois Manufacturers Ass'n.

"How To Plan and Develop Market Research that Will Pay Dividends," by A. C. Nielsen, president, A. C. Nielsen Co.

"Advertising and Marketing Lessons We Have Learned From the Depression," by Bennett Chapple, vice-president, American Rolling Mills.

"Who Is the Industrial Manager and Who Is the Industrial Sales Manager," by L. R. Garretson, advertising manager, Leeds & Northrup.

"Industrial Art as An Ally of Advertising," by W. H. Dohner, art director, engr. dept., Westinghouse Elec. & Mfg. Co.

"Sales Promotion Program of Crane Co.," by R. G. Creviston, Sales Prom. Mgr., Crane Co.

"Collective Catalogs," by William Buxman, vice-president, McGraw-Hill Directory Pub. Co.

"House Organs that Have Made Sales During the Depression," by R. K. Clark, Shell Petroleum Co.

Other speakers who will participate in the discussions and clinical sessions are: Dale Wylie, Iron Fireman Company; Frank Wyse, Bucyrus-Erie Co.; J. D. Ferch, Harnischfeger Corp.; B. R. Graff, Creamery Package Co.; R. Davison, New Jersey Zinc Co.

The exhibits which make up an important feature of the convention will show diversified specimen material which is being successfully used in sales promotion work in many fields.

◆ Census of Forest Products 1932*

The Bureau of the Census announces that, according to a preliminary tabulation of data collected at the annual Census of Forest Products taken in 1933, the total quantity of pulpwood consumed by 169 pulp mills in 1932 was 5,233,085 cords, a decrease of 13.3 per cent, as compared with 6,033,312 cords consumed by the same mills in 1931. The production of wood pulp by these mills in 1932 amounted to 3,487,493 tons, a decrease of 13.4 per cent, as compared with 4,027,053 tons in 1931. These 169 mills accounted for 89.7 per cent of the total consumption of pulpwood and produced 91.3 per cent of the total output of wood pulp in the United States in 1931. Assuming their proportionate consumption and production to have been approximately the same in 1932 as in 1931, an aggregate consumption of about 5,834,000 cords of pulpwood and an aggregate production of about 3,820,000 tons of wood pulp during that year are indicated. The corresponding totals for 1931 were 6,722,766 cords of pulpwood and 4,409,344 tons of wood pulp, respectively.

The following statement compares the consumption of pulpwood and the production of wood pulp in 1932 and 1931 by the 169 mills in question. In this statement, which covers about 83 per cent of the total number of active mills, 25 states are represented. As soon as returns are received for the remaining mills, a report giving complete figures will be issued.

Pulpwood Consumed and Wood Pulp Produced by 169 Identical Mills: 1932 and 1931

	1932	1931	Per Cent of Decrease
Cords of pulpwood consumed..	5,233,085	6,033,312	—13.3
Tons of wood pulp produced...	3,487,493	4,027,053	—13.4

(*) Compiled by the Bureau of the Census, Department of Commerce, in co-operation with the Forest Service, Department of Agriculture.

"ME?
I'm starting today to Revamp Pipe-Lines!"

"YOU BET! I've seen the light. Piping costs are away down now; but they'll not always be at the bottom. When demand lets loose, it's not going to catch us napping. I'm starting today to overhaul our pipe-lines, put 'em in A-1 working condition—stock lines, white water, waste, exhaust steam, water supply—all. And what's more, I intend to use Armco Spiral Welded Pipe, the pipe I tried out several months ago and found mighty good, and inexpensive. I noticed that the pipe crew handled it fast; that it went in easy, even in mean layouts; that it speeds flow and steps up volume because it's smooth inside." Our advice to paper-mill men is this: put your piping systems in first-rate operating shape and be ready for the rush—and do it with the pipe that is really custom-made for paper-mill uses—Armco Spiral Welded Pipe.

THE AMERICAN ROLLING MILL COMPANY

Executive Offices: Middletown, Ohio
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Small space occupied, any capacity, low over-all operating costs, high and extreme efficiencies, reliability, low initial investment.
Complete power plants to meet any operating conditions of Pulp and Paper mills or other Industrial service. Engineering and Construction.

Satisfactory Services Always Guaranteed.

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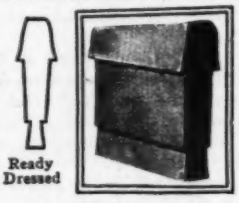
THE MOST ECONOMICAL FILLING THAT CAN BE PUT IN A MORTISE WHEEL



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CAST • ROLLED • FABRICATED

for all equipment exposed to corrosion by sulphite acids

MICHIGAN STEEL CASTING CO., DETROIT, MICH.

PULP MILL MACH'Y ◆ FINISHING ROOM MACH'Y
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The MOORE & WHITE Co.
PHILADELPHIA, PA.
N. PHILA. STA. PENNA. R.R.
PAPER MILL MACHINERY

A NEW ERA IS COMING

Paper manufacturers and converters who have examined our new napkin machine agree with us. This new machine is going to change the manufacturing methods of many progressive producers of paper napkins. We shall not go into detail, but we do suggest that you watch these pages for some mighty interesting news concerning this machine next month.

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GREEN BAY - - WISCONSIN

H-S MACHINE CO.

Boilers • Engines • Pumps
Turbines • Unit Heaters

MURRAY IRON WORKS COMPANY

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The Paper Industry Safety Contest

July 1, 1932, to June 30, 1933
Scores as of April 30, 1933
14 Mills Still Say "Perfect"

PERFECT SCORES
Division I—Paper and Pulp Mills

	PARTICIPANT	MILL	LOCATION
GROUP A			
GROUP B	Fraser Companies, Ltd.	Fraser Paper, Ltd.	Madawaska, Me.
GROUP C	St. Croix Paper Co.	Woodland	Maine
	Cornell Wood Products Co.	Cornell	Wisconsin
	Consolidated Water Power & Paper Co.	Appleton	Wisconsin
	International Paper Co.	Livermore Falls	Maine
	Consolidated Water Power & Paper Co.	Biron	Wisconsin
GROUP D	Port Huron Sulphite & Paper Co.	Sulphite	Port Huron, Mich.
	U. S. Gypsum Co.	No. Kansas City	Missouri
	International Paper Co.	Riley	Maine
	Hollingsworth & Whitney Co.	Albenaquis	Madison
	U. S. Gypsum Co.	Gypsum	Ohio

Division II—Remanufacturing

Kimberly-Clark Cor.	Atlas	Appleton, Wis.
Container Corp. of America	Natick	Massachusetts
Bemis Bro. Bag Co.	E. Pepperell	Massachusetts

IMPERFECT SCORES—Division I

	Key	Rank	Points Credit	Points Debit
GROUP A	PA- 2	1	976.688	
	PA- 6	2	760 736	
	PA-11	3	756 080	
	PA- 9	4	688 480	
	PA-13	5	465 448	
	PA-14	6	439.760	
	PA- 7	7	382.512	
	PA- 8	8		1.712.752
	PA- 5	9		5,054.902
GROUP B	PA- 1	2	911.808	
	PB-21	3	882 768	
	PB- 5	4	777.200	
	PB-14	5	763.968	
	PB-18	6	702.816	
	PA- 3	7	659 616	
	PB-22	8	608.648	
	PA-12	9	567.280	
	PB- 3	10	445.744	
	PB-19	11	342.656	
	PB-20	12	261 584	
	PB- 1	13	142.640	
	PB-12	14		254.720
	PB- 6	15		459 536
	PB-13	16		561.024
	PB-15	17		644.720
	PA-10	18		2 397.520
	PB-17	19		2 859.936
	PB- 2	20		3,846.256

DIVISION II

RD-1	4	702.624	
RD-3	5	559.024	
RB-3	6	528 880	
RD-6	7	516 432	
RB-1	8	458 912	
RC-1	9	445.904	
RD-7	10	37.712	
RC-3	11		215.456
RA-1	12		365.000

	Key	Rank	Points Credit	Points Debit
GROUP C	PC-20	6	865 024	
	PC- 8	7	856 880	
	PC-24	8	742 208	
	PB 16	9	717.632	
	PC-15	10	689.744	
	PD- 5	11	623 552	
	PB-10	12	599 488	
	PC-25	13	568 592	
	PC- 9	14	558.336	
	PC-17	15	446 000	
	PC-19	16	428.864	
	PC-13	17	390.560	
	PD-11	18		14.224
	PC-14	19		16.384
	PC-23	20		432.912
	PC- 7	21		721.264
	PC-22	22		1.167.184
	PB- 9	23		1.430.080
	PC-10	24		4 651.808
	PC-18	25		6.810.176
GROUP D	PD-12	6	860 432	
	PD- 3	7	746 416	
	PD- 8	8	719.792	
	PD-16	9	685 616	
	PD- 7	10	676.992	
	PC- 4	11	647.824	
	PC- 2	12	629 616	
	PD-14	13	130.960	
	PD-23	14		128.768
	PD- 1	15		337.040
	PD-13	16		390 400
	PD-10	17		426.016
	PD-15	18		429.648
	PC-21	19		816.544
	PD-20	20		846 704
	PD- 4	21		1.071.648
	PD- 9	22		4.825.488
	PD-21	23		10,008.976

No April Report: PC-1 and 6; RB-2.
Withdrawn: PA-4; PB-7 and 6; PC-5, 16, 26.

◆ Industrial Fatalities Decrease

The National Safety Council's final estimate of industrial deaths last year is 15,000—a reduction of 2,000 fatalities from the 1931 toll. Less than 3,000 of these occurred in manufacturing plants, the others happening in mines, railroads, construction work, marine operations, farms and other fields not definitely a part of ordinary manufacturing.

The handling of objects, use of machinery, falls and falling objects were leading industrial accident causes. Resulting cuts and lacerations constituted about 30 per cent of all industrial accidents.

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Whenever you need any steel or allied products for new work . . . maintenance . . . or repair, write, wire or 'phone the Ryerson Company. All materials are in stock for immediate shipment.

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Safety Treads
Small Tools
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Write for the Ryerson Stock List —the "key" to Immediate Steel.

JOSEPH T. RYERSON & SON INC.
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STEEL

METSO
SODIUM METASILICATE

NEW CHEMICAL FOR PAPERMAKERS

METSO differs from other basic alkalies such as soda ash, tri-sodium phosphate or caustic. It is pure sodium metasilicate, dissolving readily, without heating, and safe to handle.

Metso provides more alkali at pH 10 than any other alkaline salt. Its pressure is maintained too, until the alkalinity is neutralized.

Send for information about de-inking, rag cooking, felt washing, or dissolving casein.

U. S. PATENT 1898707

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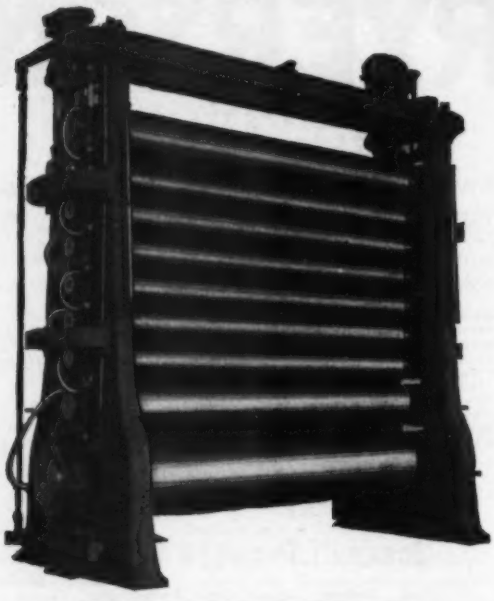
Sold in Canada by NATIONAL SILICATES LTD., Brantford, Ont.



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For Continuous, Trouble-free Service--

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Lobdell Calender Stacks are precision built, yet they're Rugged, Reliable and Capable of keeping up a high production rate consistently—and 50 years' Experience is behind every Lobdell Stack.

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Your customers are asking for better finish
Are you able to produce it?
There's a way!

KENWOOD WOOL PRODUCTS

Kenwood Super Finish Top and Bottom felts will provide you with the means by which you can deliver a board to your trade that will meet today's exacting requirements. Specify Kenwood Super Finish Top and Bottom felts in your next order. The selection will be justified by complete customer satisfaction.

KENWOOD *tanned* FELTS

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Manufacturers of Paper Maker's Felts Since 1870

TECHNICAL DEVELOPMENTS

IN THE PAPER INDUSTRY ■ DOMESTIC AND FOREIGN

The following abstracts are of the latest developments found in the foreign press and in the patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

◆ Sulphite Half-Stuff

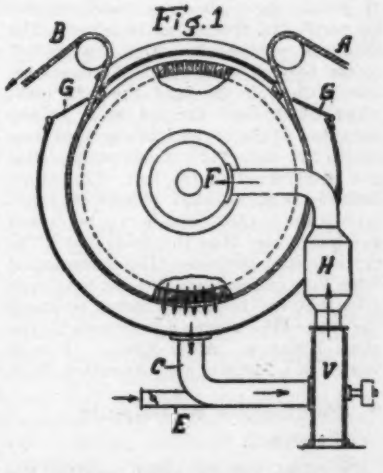
The Schwalbe method was used for producing this product. The process was divided into three parts. The first stage consisted of the impregnation of the wood chips with digestion liquor at a temperature of 110 to 120 degrees C. The liquor, which did not penetrate into the chips, was allowed to run out of the digester. The contents of the digester were then steamed in the second stage of the process with fresh steam at a temperature of 130 to 145 deg. C. The third stage was the beating of the pulp. For the sake of comparison, experiments were also carried out without steaming the chips. The paper samples, which were made from steamed half-stuff, gave higher strength figures for tearing length and folding test than the unsteamed pulp. The chemical constants, particularly the content of lignin and pentosans, was almost alike in all cases. Steaming gives the fibers elasticity, but it also decomposes the compounds, which are formed between sulphur dioxide and organic substances, with the result that undesirable brownish discoloration of the half-stuff takes place. Alkaline after-treatment with one per cent sodium hydroxide at a temperature of 45 degrees for six hours increases the strength of the half-stuff and its capacity for hydration. Both these properties are, however, impaired when the pulp is after-treated with 1.5 per cent sodium hydroxide for eleven hours at a temperature of 70 deg. C., and also at a temperature of 120 deg. C. within three hours. When the half-stuff is digested with alkali, apparently the same phenomena take place as in the manufacture of half-stuff, that is the pentosans and the carbohydrates principally pass into solution, while only a small proportion of lignin is dissolved. The opposite takes place in treating the half-stuff with chlorine. The lignin is precipitated and the hemicelluloses are dissolved due to hydrolysis. Approximately 60 per cent chlorine, which is figured on the absolutely dry weight of half-stuff, is required for the complete bleaching of the half-stuff.

Half-stuff, as far as its chemical composition is concerned, as well as the nature of the fibers, is rather mechanical wood than chemical pulp. Only the ease with which half-stuff can be hydrated differentiates it from mechanical wood. Sulphite half-stuff can, therefore, scarcely supplant chemical pulp. According to the author, a new principle must be sought in the search for new methods for the production of half-stuff in higher yield than obtained in the manufacture of chemical pulp. These processes must be able to produce not so much a half-stuff, which is contaminated with lignin impurities, but rather one from which the greatest part of the lignin has been removed without any noticeable loss of hemicelluloses. N. J. Truchoff. Bumaschnaja Promischlennost, 1932, number 9.

◆ Rapid Felt Drier

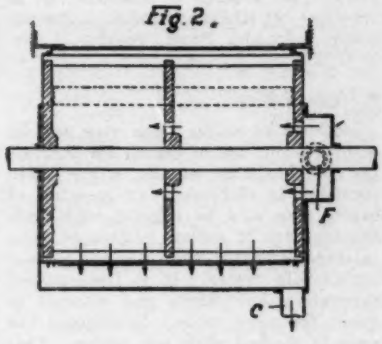
A new type of felt drier is shown in Figure 1. The felt passes around the guide roll (A) and the perforated cylinder or drum. The felt is held under tension on the circumference until it reaches the second guide roll (B). The upper part of the cylinder between (A) and (B), which is not enveloped by the felt, is surrounded by a cover. This is made in such a manner that it is not possible for the hot air to escape except in very small quantity. The hot air is sucked out by the fan (V) and after passing through the air reheater (H), it enters the perforated cylinder through the inlet (F). The hot air then passes through the felt. A sheet metal casing is arranged at a certain distance from the drum or cylinder and a jacket is thus formed in the lower part of which is collected air which has passed

Fig. 1



through the felt once and which has not become saturated with moisture. The fan exhausts this air through the outlet (C) for reheating and reuse. The flaps (G) can be regulated so that the air saturated with moisture is eliminated from circulation, this being useful in facilitating the rapidity of drying. Fresh air enters through the inlet pipe (E) which is provided with a flap valve for regulating the admittance of air. In the case where extra-thick felts are being dried, there is always the danger that the air will cause them to swell up and raise them from the surface of the cylinder. To overcome this the flow

Fig. 2.



of air is reversed, so that the air is blown in at (C) and sucked out at (F). The construction of the inside of the cylinder is shown in Figure 2 as well as the direction of the flow of air. French Patent No. 738,325. Reinhard Schultze.

◆ Hydration and Strength of Paper

Hydration is a strength factor in paper sheets. The development of hydration during the beating process is explained by the results obtained in research work on the fine structure of the fiber. Cellulose is capable of swelling to a pronounced degree, but in unbeaten material such swelling is greatly restricted by the presence of the foreign membrane system and the incrustants in the fiber. The cellulose is exposed only by the beating and then forms the mucous substance which adheres strongly to the fibers during drying. This accounts for the variations in strength of the different half-stuffs. G. Rutz. Der Papier-Fabrikant, volume 30, pages 704 to 706.

◆ Soudakov Straw Pulp Process

Straw is treated in the cold in this process. In the laboratory tests carried out to prove the efficiency of the process, the straw was soaked for twelve hours in a solution containing 1.25 to 2.5 per cent of sodium hydroxide, twelve to eighteen per cent of the caustic solution being used on the air-dry weight of straw. The latter was then dried and water added to it until a concentration of six per cent dry fiber was attained. Then the mixture was cooked for nine hours under a reflux condenser. The mass was then washed, dried, ground and treated with a solu-

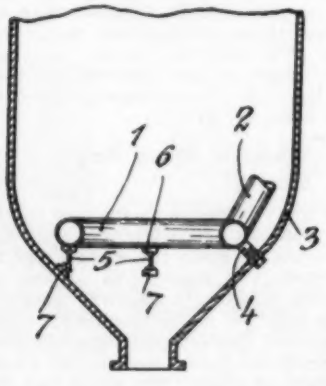
tion of chloride of lime in sufficient quantity to correspond to a consumption of three to eight per cent of active chlorine. The duration of bleaching was six hours at a temperature of 30 to 35 degrees C. In the semi-plant and plant tests digestion was carried out under a pressure of 2.3 to 4.5 atmospheres over a period of two to three hours with superheated steam. The yield of bleached straw pulp in the large-scale tests was 44.5 per cent. Laboratory experiments proved that preliminary grinding or crushing the material facilitated bleaching and gave a more uniform yield. This process is concluded to be practical. C. Khazanov and N. A. Strounnikov, Boumajn. Prom., volume 11, No. 4, 47-51.

◆ Rosin Size

Methods of using rosin size are described. The use of starch for increasing the stability of the milky rosin emulsion is discussed. Preparation of brown size may be effected with soda ash in place of sodium hydroxide. The mixture is heated until it gives a clear solution in water. It is then passed through a hair sieve and allowed to stand for some time. Sometimes the soap is washed with salt water. This improves the color. The size is usually prepared with the addition of a little starch or gelatin. White rosin size is made with about one per cent starch. The starch is prepared in the usual manner and then the rosin soap emulsion is added with stirring. This rosin size gives a white emulsion in water and is more economical to use, two per cent being sufficient for good results. The amount of aluminum sulphate required must be determined empirically. Anon. Le Vernici, 1932, page 23.

◆ Circulating Pulp Digester

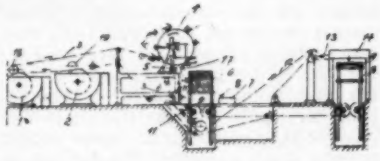
The pulp digester is provided with a circulating pipe for the liquor. The circulating pipe is permanently fastened to a perforated bottom. The latter is arranged in the digester in



such a manner that the solid substance does not settle in the perforations. This avoids any difficulty in emptying the digester and also any interruption in the operation of digesting the pulp. As may be seen from the accompanying illustration, the circular perforated bottom (1) is connected at a certain point with the liquor circulating pipe (2), which is in turn connected with the circulating pump. At the point where the pipe joins the perforated bottom or in its immediate neighborhood the latter is screwed tightly to the digester wall (3) by means of the lug (4). The perforated bottom (1) is supported on the supports (5) and (6) which rest in spherical cups (7), attached to the wall of the digester. Einar Moretrud, Tordeoed, Norway. German Patent No. 557,694.

◆ Coated Cardboard

The apparatus for carrying out the process of making cardboard, which is coated with a special coating on one or both sides, is shown in the accompanying illustration. The two webs are made on the cylinder wires (1) and (2), these webs being taken up by the felt (3). This felt leads to the forming cylinder



(4), on which the layers of cardboard are arranged in order one after the other, after which they are carried along, at the same time as the two webs on the felt (3), between the forming cylinder (4) and press roll (5) located below the cylinder (4). The moist cardboard sheets are piled up in the pile (6). The operator stands on the platform (7) and presses on the pedal (8), by means of which the table (9), which carries the cardboard sheets, can be raised. The sheets of cardboards which are applied to the coating webs reach the space between the felt (3) and the felt (10), after which they are led away in the direction of the arrow (11) so that they reach the belt (12), from which they are transferred to the belt (13) which delivers them at (14). There they fall on the table (15), which can be moved vertically just like the table (9). The movement of the table (15) is connected with that of the table (9), so that each step that the table (9) moves upwards the table (15) moves downwards by the same distance. Alois Ederer. French Patent No. 740,951, filed August 8, 1932.

◆ Permanence of Sulphite Papers

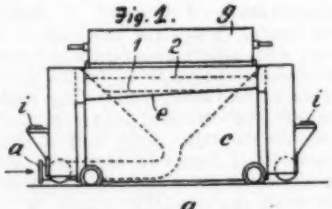
Practical factors which control the permanence of sulphite paper were studied. Manufacturing conditions, which affect the permanence of these papers, were described in detail. An easy-bleaching Mitscherlich pulp, which consumes approximately three per cent of chlorine, is recommended as the chief portion of the stock. Bleaching should be carried out slowly in the cold, and no anti-chlor is added. Efficient washing is essential; beating must not be excessive, and the quantity of aluminum sulphate used in sizing should be kept at a minimum. A high free-rosin size is helpful in this respect. Maximum drying temperature should be approached gradually, and should not exceed 85 degrees C. J. Strachan. Paper Maker, 1933, volume 85, pages 33 to 34TS.

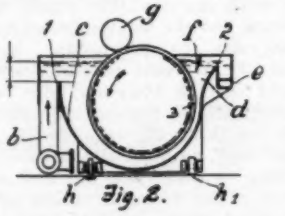
◆ Structure of Cellulose Fibers

There is a close relation between the structure of the cellulose fiber and its strength and also its behavior in chemical treatment. This has given an important cast to the technical problem and the study of the morphology of the fibers has been of real assistance in the production of a high grade pulp and paper. Hence the literature on the subject is thoroughly reviewed, so that the paper chemist can secure a good idea of what has been published on the subject in all its phases. Thus the literature on methods and apparatus for observing the swollen structure of the cellulose fiber reveals a great deal of experimental and scientific work. Attention is also given in this review to investigating the structure of the fiber with the aid of the Peterfi micro-manipulator, to polariscopic-microscopic studies, to isolation of the cell wall entities, decomposition of fibers in carbonization, the importance of fiber morphology in pulp beating, the felting quality of the pulp fibers, and the strength of the fibers, etc. Dr. D. Krueger. Zellstoff und Papier, volume 13, pages 9 to 12.

◆ Cylinder Paper Machine

Two views are shown of this new machine, Figure 1 being a front view and Figure 2 a cross-section. The pulp-water mixture flows from a stuff-tank through the pipe (a) and an inlet pipe (b), which is arranged so that it extends over the entire width of the stuff-chest (c), into the cylinder wire vat over the inlet edge (1). The overflow edge is shown at (2), while (e) is an





inclined run-off gutter, which opens out into a waste box, from which the mixture of pulp and water is again forced into the stuff-chest by means of a pump.

The special construction of the cylinder vat at the point of overflow in the

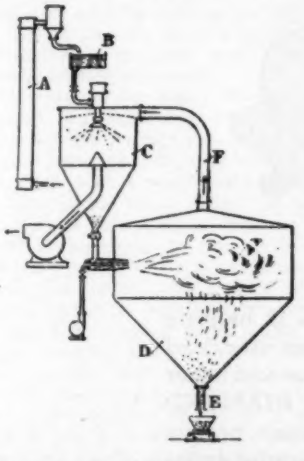
form of a longitudinal funnel (d) parallel to the axis of the cylinder has for its purpose to gradually diminish the speed of the stock water between the cylinder wire circumference (3) and the inlet box. Thus the sheet of paper which is being formed on the wire is not carried away by the stock water as it runs off, but the web is taken up from stock mixture which is almost stationary.

It is claimed that with the aid of the new arrangement it is possible to make particularly thick sheets of 160 to 500 grams per square meter without any danger of the web floating off in the stock water.

In order to prevent further motion of the stock, a plate (f) is inserted in the vat to dam the flow. This plate also has an advantageous action in preventing the foaming of the stock and affords a perfectly still surface of stock between it and the cylinder wire. These arrangements avoid all disturbances in the formation of the web and also prevent the thickening and settling of the stock with the result that a perfectly uniform web is formed. The take-up roll is shown at (g), while (h) and (h^1) are carrier rollers for the machine, and (i) is a port of entry for the worker attending the machine. Alois Purkert Papier und Pappenfabrik A. G. German Patent No. 563,023.

◆ Reworking Waste Liquors

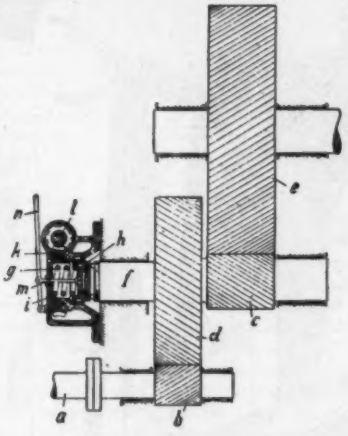
The waste liquors are first preconcentrated in an evaporator (A) shown in the accompanying illustration. The preconcentrated liquor flows from the tank (B) to an atomizing device in the drying chamber (C), where the sprayed liquor is converted into a dry powder by contact with hot gases. The final



result is an impalpable powder which is removed at (E). This powder contains the major part of the organic substances originally contained in the waste liquor. The powder, which is obtained in the preceding stage of the operation and which possesses a high thermal value, is burnt in the chamber (D). The ash drops to the bottom of the chamber and represents the inorganic matter contained in the waste liquor. The hot gases of combustion are returned to the drying chamber (C) through the pipe (F). The solid residue obtained at (E) is ready for causticization. Appareils et Evaporateurs Kestner. French Patent No. 714,349. Filed July 19, 1930.

◆ Regulating Wood Grinders

The driving shaft is connected with the shaft of the grinder through a system of connecting gears on a shaft which can be shifted axially, so that the axial shifting of the connecting gear's shaft is used for regulating the wood grinder. Thus, as may be seen in the accompanying illustration, when the load on the wood grinder increases, then an increased axial pressure is induced in the shaft (f), with the result



that the shaft (f) is shifted against the pressure of the spring (g). The shifting of the shaft causes a movement of the regulating rod (m) (n), which acts to decrease the pressure of the wood against the surface of the grindstone. The reverse process takes place when the load on the grinder decreases. Allgemeine Elektrizitaets-Gesellschaft, Berlin, Germany. German patent No. 560,848.

◆ Continuous Bleaching of Paper

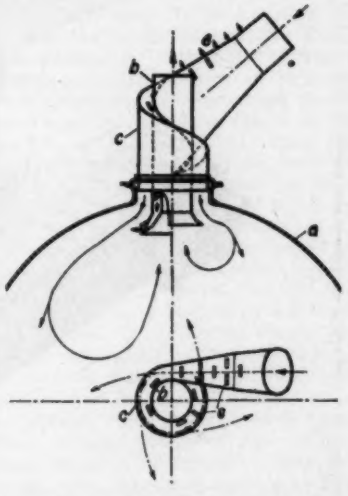
The material, impregnated with the bleach liquor, is placed in loose form on a carrier which moves at constant speed and is then taken from the same, after it has been transported over a certain distance, for further treatment. Bleaching of the stock takes place without any mechanical action on the same. The fibers and bleaching liquor are completely at rest, so that both hydration and injurious action on the fibers are avoided as far as possible. The fiber loss is very small in this process. Emil Ekeberg, Konga, Sweden. Finnish Patent No. 14,193, filed August 16, 1930.

◆ Sizing Compound for Paper

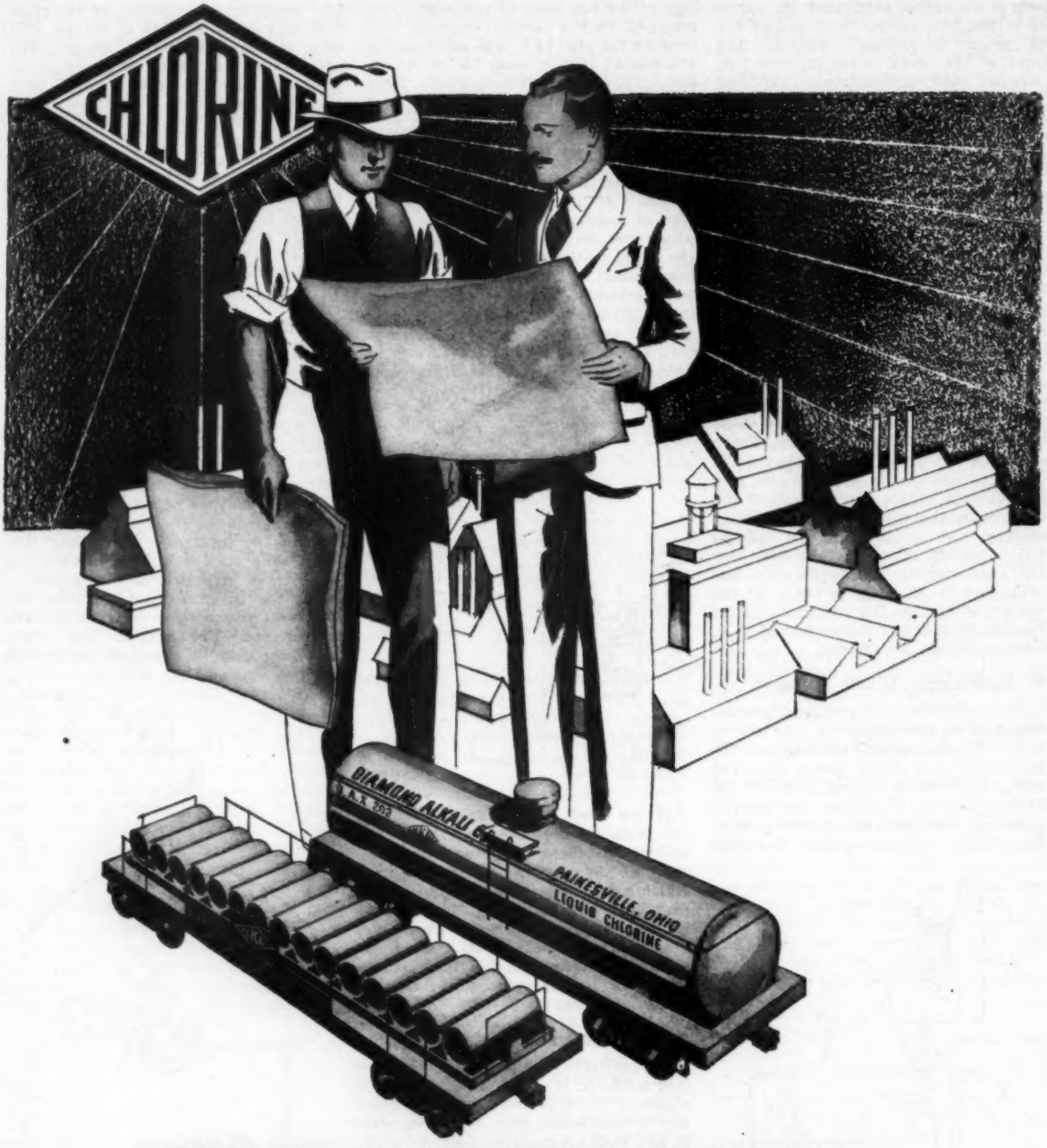
The feature of this composition is that it does not become foul. It contains a waterproofing substance, such as paraffin wax, mineral oil, pitch and the like. The particles of the waterproofing substance are enclosed by a precipitate which may be formed by the reaction between a solution of sodium silicate or the like and a precipitating agent such as aluminum sulphate, hydrated calcium oxide, hydrochloric acid, etc., or zeolitic substances which form insoluble hydrated silicates or mixtures of silicate and silicic acid. The composition also contains a protective colloid, such as glue or casein. For example, the wax may be melted and formed into an emulsion with sodium silicate solution. Alum is then added and the composition is agitated and added to the paper pulp. G. J. Manson. British Pat. No. 363,372, filed June 6, 1930.

◆ Charging Spherical Digesters

The device, which is used for charging spherical digesters, is shown in the accompanying illustration. It consists of an outlet pipe (b), extending into the digester, this pipe being of cylindrical shape and formed into a funnel at the lower end. This pipe is for the introduction of the propellant. The device also consists of an inlet pipe (c) which surrounds the inner outlet pipe (b) in the form of a spiral and this inlet tube ends at a point above the end of the pipe (b), so that an annular space is formed between the two pipes for the mixture of stock and the propellant. The mixture of stock and propellant is therefore introduced



through the inlet pipe (c) and there it attains a certain motion by which the heavier particles in the stock are flung against the outside wall. As the stock enters the digester, the direction of the flow of stock is changed downwards due to the action of centrifugal force and the lower end of the pipe (b) which is bent outwards. This results in good distribution of the stock around the digester and facilitates easy separation of the chips from the propellant air, so that the latter is released and can flow out through the pipe (b). In order to obtain even better distribution of the stock, openings (e) are arranged in the pipe (c) which can be closed or opened to any desirable extent. Paul Pieper. German Patent No. 558,844.



THE positive action of DIAMOND Liquid Chlorine is helping many paper manufacturers to maintain the highest standard of quality and production economy. ● Combating algae and other biological growths attendant to paper manufacture, DIAMOND Liquid Chlorine not only eliminates slime stains and loose, porous sheets, but also assures better beating conditions and more satisfactory drying. ● DIAMOND Chlorine is readily available in either single or multiple type tank cars from our plant at Painesville, Ohio.

DIAMOND ALKALI COMPANY
PITTSBURGH, PENNSYLVANIA AND EVERYWHERE

DIAMOND CHLORINE

The COMMERCIAL OUTLOOK

New York, June 1, 1933.

IT can be said, and with a profound degree of accuracy, that the proverbial "corner" which the American public has been seeking for a period of three years or longer has, from a general business standpoint, been turned. On all sides are indications of decided industrial and trade improvement; these signs are no longer intimations alone, they constitute definite, actual, concrete evidences of increasing employment, growing demand for various commodities, speeding up of manufacturing operations, a broadening of buying power—all the outgrowth of rising prices for commodities and securities, based on a stronger financial situation, improved sentiment, confidence in the Washington administration, and the feeling which has become common that the depression not only has been definitely checked but that business is now headed forward.

Certain manufacturing industries are registering pronounced gains in production, employment and sales. Foremost among these are the textile, automotive, steel and clothing industries. Mills and factories within these branches of manufacturing are finding it necessary to appreciably increase their output owing to the expanding market demand for their products; additional workers are being employed, raw material purchases are being enlarged, operating schedules are being extended, and, in quite a few cases, wage rises are being put into effect. Statistics relating to industry and trade, both as regards all business as a whole and the individual branches, are exceedingly favorable, showing a consistent gain in market activity and in the production and movement of manufactured products and merchandise, wholesale and retail.

As concerns the paper industry specifically, it appears that the pick-up in paper market activity has lagged somewhat behind that in some other lines. There has been a considerable increase in demand for some classes of paper and board; certain manufacturers have found it necessary to step-up production, and there is no doubt that consumers, converters and jobbers in numerous instances have broadened their buying, but, viewed as a whole, the paper industry is not as yet favored with as much improvement as is noted in some other manufacturing industries. This is not unusual because it is a recognized fact that demand for paper is one of the last to become affected in an upturn in general business as well as in a quieting period.

That paper manufacturers confidently look for larger business, better market conditions, higher prices and continued general improvement is apparent in the attitude they are adopting concerning sales and prices. Perhaps the most important development within the industry during the last few weeks is the changed policy put into effect by a majority of paper manufacturers relative to the acceptance of orders for their product and terms of prices. One of the foremost book paper mills of the country has advised its merchant customers thusly: "Owing to the uncertainty in the costs of raw materials we can accept orders for any of our grades of paper for merchant stocks only with the understanding that prices prevailing at the time of shipment will govern such orders." The obvious object of this policy, aside from protection for the manufacturers against further rises in raw materials, is to forestall purchases ahead by paper merchandising concerns at current prices or the loading up of supplies by merchants while letting the manufacturer "hold the bag" as regards prices.

Another paper manufacturer, probably the largest producer of fine writing papers in the United States, has announced as follows: "We are not accepting orders for plate manufacturer at present prices. We would, however, accept orders for immediate manufacture to be billed at once and shipped at a later date. Provided we could cover ourselves on raw materials we would be willing to accept certain types of business at firm prices for shipment within a 90-day period but not beyond this." In short, paper manufacturers are guarding themselves against promiscuous purchases by customers at prices now ruling and delaying shipments, which seems proof positive that paper manufacturers anticipate advances—perhaps sharp advances—in prices of raw materials and in their finished product.

The raw material factor is a particularly important one at present. Prices of almost all raw materials used by paper mills have registered broad advancement over the past month. Some items, notably certain grades of new and old rags and some classes of waste paper, have risen a full 100 per cent. Wood pulp is about the only raw material consumed in the manufacture of paper which has not increased appreciably in cost, and prices of pulp are pointed upward and seem certain to rise. The higher cost of raw materials is not yet reflected to its full degree in prices of finished paper and board, but it stands to reason it will be in due time.

Some advances of moment have been recorded in paper prices. Book paper producers have jumped prices of coated book papers $5 a ton, and prices of uncoated book appear about to follow the rise. Wrapping paper prices have firmed to where No. 1 kraft is generally quoted at 2.87½ to 3 cents a pound New York, compared with 2.67½ and 2.75 cents a few weeks ago. Some lines of fine paper have stiffened in price. On the other hand, mill quotations on newsprint, most writings and ledgers, tissue, cover and fibre papers and on boxboards show no change. The strange thing is that paper mills continue to market their product at unaltered prices when raw material costs have mounted to such a sharp extent.

Production of newsprint in the United States in April amounted to 74,507 net tons and shipments from mills were 76,095 tons, compared with 76,566 tons produced and 77,857 tons shipped in the preceding month. Production in Canada was 147,759 tons and shipments 161,266 tons during April, against 137,078 tons and 140,694 tons, respectively, in March, according to the News Print Service Bureau. The combined total for the two countries amounted to 222,266 tons produced, against 213,644 tons in March, and 237,361 tons shipped, contrasted with 218,551 tons. During April 19,048 tons of newsprint were produced in Newfoundland and 1,179 tons in Mexico, so that the total North American output for the month amounted to 242,493 tons, compared with 236,503 tons in March, and 211,301 tons in February. The Canadian mills produced 112,599 tons less newsprint in the first four months of 1933 than in the same time last year, a decrease of 17 per cent. The output in the United States was 80,178 tons or 21 per cent less; in Newfoundland 8,233 tons or 9 per cent less, and in Mexico 1,094 tons more, making a total net decrease of 199,916 tons or 18 per cent. Stocks of newsprint at Canadian mills at the end of April were 37,232 tons, and at United States mills 21,171 tons, making a combined total of 58,403 tons, contrasted with 73,498 tons on March 31 last.

Judging from reports and figures from various corners of the industry, paper mills of the country, taken as a group, have increased their production at least 15 to 20 per cent during recent weeks. That this uptrend in manufacturing activity will be expanded and extended as consuming industries become livelier and have need of larger tonnages of paper, is the opinion common in the industry. There is a big potential demand for paper of practically all kinds pending, and it is believed it is on the threshold of asserting itself to a degree which will lead to substantially larger orders for mills and a marked expansion of activity throughout the industry.

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◆ PULP BLEACHING Corp., New York, has moved its offices to a new location at 44 Main Street, Orange, N. J.

Domestic RAW MATERIALS

◆ Papermaking Rags

In keeping with the general advance in commodity prices, papermaking rags have assumed an upward course and some grades have recorded a sharp rise. The forward march of the market has not been predicated entirely on expectations of bigger consumption and broader business; consumers have been more in evidence as buyers and have increased their purchasing as regards some descriptions of rags, while the bullish supply condition has had considerable to do with the upturn in prices. Buyers are finding it no easy matter to locate the supplies desired; although there is no acute shortage of rags of any kind, the fact that mill buying has expanded and that subnormally low prices for a long time have disrupted the collection and grading machinery, thereby reducing facilities for increasing the available supply to keep pace with the growing demand, have led to a distinct scarcity of some grades of rags for paper mills.

Strangely enough, perhaps, papermakers are concentrating their purchases on the highest and the lowest types of rags, and it is these which have registered the sharpest price advancement. The better grades of new cotton and linen cuttings have jumped in market value as a result of broader buying interest among paper manufacturers, while the rise in roofing rag prices has been little short of sensational. Ideas of prevailing market levels vary so widely that it is difficult to specify what actually constitute current prices on cotton cuttings. There have been reports of sales of No. 1 new white shirt cuttings to mills at 5.50 cents a pound delivered, and of new unbleached cuttings at 6.25 cents delivered; it is more than likely these prices have been realized and that in some instances even higher have been paid. Prices of new cuttings are at best nominal, as the market has advanced so rapidly it has not yet settled to a degree where definite quotations are possible. At any rate, dealers are reported asking higher than 5.50 cents for No. 1 white shirt cuttings, 2.25 cents and more for fancy shirt cuttings, 4.25 cents for light flannelettes, 4 cents and up for light silesias, 4 cents for blue overall cuttings, 2.50 cents for black silesias, 2 cents for bathrobe cuttings, 5.25 cents for bleached shoe cuttings, and 4 cents for new khaki cuttings. New white linen cuttings are quoted at 8 cents and higher at dealers' shipping points, and grey linen at 6.50 to 7 cents.

Roofing rags have been sold at prices almost doubling those ruling only a few weeks ago. In the East, felt mills have paid 80 cents per hundred pounds for No. 1 domestic roofing, and 70 cents for No. 2 stock, and in at least exceptional cases foreign dark colored cottons have brought 90 cents ex dock U. S. Atlantic ports, and foreign linsey garments 1.05 cents a pound. Old white cottons and thirds and blues are lagging behind in the price advances, but are tending upward and dealers are exercising care in entering sales commitments. No. 1 repacked whites are reported obtainable at 3 cents per pound at shipping points, No. 2 repacked whites at 2 cents, and repacked thirds and blues at a cent to 1.10 cents a pound.

◆ Old Paper

The feature in waste paper is the sharp rise in prices of the low grades in the East. Old No. 1 mixed paper has advanced in New York from 20 cents per hundred pounds to where sales to boxboard and other mills have been made at 40 cents f. o. b. that city, and folded newspapers have jumped in value to 47½ and 50 cents per hundred pounds. Old kraft paper has firmed up to a price level of 85 cents per hundred f. o. b. eastern centers, and white shavings have ruled very firm quotably at around 1.90 cents a pound for No. 1 hard white, 1.50 cents for No. 1 soft white, 1.70 cents for one-cut soft white shavings, and 2.10 cents for No. 1 hard white envelope cuttings. Old corrugated boxes are bringing 45 cents a hundred pounds at shipping points, new kraft cuttings 1.35 cents a pound, and white news cuttings 1.20 cents per pound. Old book stock is the one class of waste paper standing still in price; sales in the East being reported at 60 cents a hundred pounds for No. 1 heavy flat magazines, and around 47½ cents for crumpled books.

◆ Rope and Bagging

It is nothing unusual for dealers to quote 2.50 cents a pound to paper mills on old manila rope. Demand for this article has broadened considerably, and much stress is put on the small lots reaching the market from production sources, and from abroad. It is doubtful whether this price has been paid by mills, though it is possible, and dealers and importers are predicting a 3-cent old rope market in the near future. Importers assert they themselves have to pay at least 1.70 cents a pound to get No. 1 rope in Europe, with limited supply obtainable at this cost basis. Bagging also is rising in value. Extra quality No. 1 scrap burlap is reported bringing one cent a pound in sales to mills, and perhaps higher, while roofing bagging is worth all of 55 cents a hundred at shipping points. Gunny bagging is up around 1.10 or 1.15 cents a pound delivered mill points.

◆ Mechanical Pulp

Consumers are manifesting more desire for mechanical wood pulp and in some cases have increased their orders appreciably. The price tone is firmer and such changes as have been noted have been in a higher direction, though no broad advancement has been scored. The basis prevailing in the East is about $20 per short ton ex dock Atlantic seaboard for both Canadian groundwood brought down from the Dominion by schooner and for Scandinavian groundwood, which would make the cost to consuming mills delivered somewhere in the vicinity of $26 to $27 a ton, depending on the inland freight. Domestic groundwood is on about this same price level, or around $20 a ton f. o. b. grinding mills. Producers are said to be less eager to sell than they were, indicating that they anticipate a stronger market and higher prices, particularly domestic and Canadian grinders, owing to the strengthening market in Scandinavia.

◆ Pulpwood

Pulp companies are reported engaged in seasonal purchases of pulpwood, with commitments on a fairly large scale. Prices are firm of tone, although ranging about $1 per cord below the market rates ruling at this time last year.

◆ Chemical Pulp

The change in the chemical pulp market in recent weeks has been chiefly sentimental. Actual price advances have occurred but they have been small; however, the general expectation is that foreign pulps are due to increase in cost as a result of higher exchanges. and domestic manufacturers realize that if imported pulp prices rise, they will be enabled to get more for their product. Sellers are somewhat wary, therefore, and are not pressing for orders, but seem satisfied to wait out the market until matters, and foreign exchanges especially, are more settled and the effect on pulp prices is determined. Domestic prime bleached sulphite continues on a quotable basis of 2.10 cents a pound ex dock Atlantic seaboard, while unbleached sulphite is on a price range of 1.40 to 1.75 cents, according to quality, f. o. b. pulp mills, and domestic kraft pulp 1.25 to 1.75 cents at producing plants. Bleached soda pulp is quoted at 2 cents a pound delivered book paper mills.

◆ Chemicals

Firmness characterizes quotations on papermaking chemicals, which in a majority of instances exhibit an upward tendency. Soda ash is 1.30 cents per pound at works for contract lots packed in bags; caustic soda is 2.55 cents upward for the solid product at works on contract; bleaching powder 1.75 to 2 cents in drums at works, and sulphur $18 to $20 per long ton f. o. b. mines. Casein prices have advanced to 9-11 cents a pound, according to grade, for domestic and 10 to 10.50 cents for Argentine casein.

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◆ THE BRISTOL CO., Waterbury, Conn., announces the removal of its New York office to the Daily News Building, 220 East 42nd St. C. W. Williamson, district manager, continues in charge.

Import and Export MARKETS

IMPORTS

◆ Wood Pulp

The situation in imported wood pulp appears to have attained a point where it can be stated that the future position of market prices depends on such additional changes in foreign exchanges as may occur over the next few weeks. The condition of the market, from a forward price standpoint, has been for some time, or since the United States went off the gold standard, complex indeed. The trade has been about equally divided between those who could foresee nothing but substantially higher prices for imported chemical pulps, and those who felt no broad market changes would be witnessed. The rise in Scandinavian exchanges has approximated 15 per cent during the last couple of months; this has led to an equalization of prices producers of pulp in Europe are receiving for their product sold to the United States and marketed in other consuming countries; in short, prior to this uptrend in European exchanges, Scandinavian pulp was being sold in countries other than the United States at prices about 15 per cent below those obtained in sales in our country, whereas now this difference in monetary returns has been wiped out by the decline in the exchange value of the dollar and appreciation of European currencies.

A close study of the market's probabilities reveals the opinion, commonly held by most members of the trade, that if money values remain at about present parities, there will be little change in chemical pulp prices quoted from Europe and accepted by Scandinavian and other producers on the other side of the Atlantic in sales to American consumers. The European manufacturers apparently are satisfied to continue supplying pulp to customers in this country at prevailing prices.

Meanwhile, something of a waiting condition is seen in the pulp trade. Not only are consumers in the United States, in a majority of instances, hesitant to place orders for pulp supplies other than more or less definitely needed, but producers on the other side of the Atlantic are none too ready to enter sizable sales commitments ahead. There are some paper mills evincing desire to purchase pulp in good tonnage and for some time into the future as regards deliveries; they, however, are willing to place contracts only at the market levels ruling here for some time as established prices, refusing to grant any advances, and demanding guaranties that prices will not be raised. Most mills in Europe are not keen to sell on such terms, and while there is a certain amount of routine business transpiring, and also a fair trade in spot lots of pulp, the market is not measuring up to anything like a normal scope of activity.

Prices are very firm; seldom if ever are sellers shading levels recognized as established market bases, and in certain instances slight premiums are being paid for some mill brands of sulphite pulp. Most of the business being done is negotiated through the medium of firm bids from consumers in this country and cabled over to mills in Europe for the latter's acceptance or refusal. Certain producers in Scandinavia, being well sold up, are demanding $1 and $2 per ton above the established prices on additional contracts, and are said to be securing these slight increases. Otherwise, prime bleached sulphite is selling at 2 to 2.10 cents a pound ex dock American Atlantic seaboard, according to grade; prime strong unbleached sulphite at 1.50 to 1.60 cents on the dock, and prime Scandinavian kraft pulp at 1.25 cents. Spot lots are bringing these same prices, although now and then a slight premium is reported paid.

Pulp imports into the United States decreased rather sharply during March as compared with the preceding month. According to official statistics issued by the U. S. Department of Commerce, total imports of chemical pulp in March amounted to only 70,467 long tons. valued at $2,657,488, contrasted with 87,891 tons of a declared value of $3,091,882 in February this year, and 80,000 long tons of a value of $3,233,515 in the similar month of 1932. The March imports brought the total for the first quarter of this year up to 282,539 long tons, valued at $9,856,418, representing a large decline from the 406,775 tons of a value of $15,713,987 imported in the corresponding period of last year.

Current quotations on Scandinavian groundwood range around $20 per short ton for dry pulp ex dock American Atlantic seaboard.

◆ Paper Stock

Imports of rags for papermaking into the United States in March amounted to 3,613,363 pounds, valued at $23,879, compared with 4,172,238 pounds of a value of $41,606 in the month before, and making a total of 13,271,698 pounds of a value of $111,479 during the first three months of the current year, against 23,066,076 pounds of a value of $318,606 in the same time of 1932. Miscellaneous paper stock imports in March were 5,366,378 pounds of a declared value of $49,207, against 5,598,439 pounds of a value of $49,786 in the preceding month, and making a total for the first quarter of 1933 of 16,354,590 pounds of a value of $156,849, contrasted with 29,666,545 pounds of a value of $218,325 in the corresponding period a year ago, according to U. S. Department of Commerce statistics.

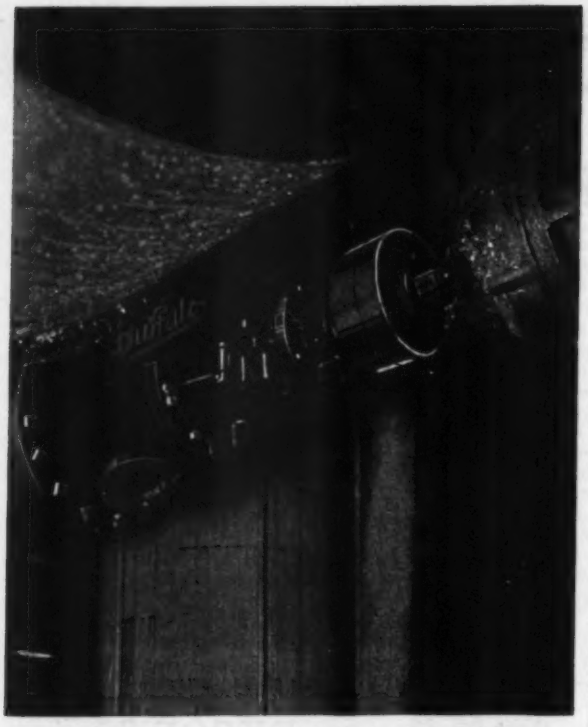
◆ Paper

Importations of paper into the United States registered an appreciable gain, in point of value, during March last as contrasted with the preceding month. The March receipts reached an aggregate value of $5,235,529, according to U. S. Department of Commerce figures, compared with $4,297,368 in February, and making a total for the first three months of this year of $15,458,579, against $24,126,827 in the first quarter of 1932. Standard newsprint of a value of $4,533,183 comprised the great bulk of the paper imports during February.

EXPORTS

In point of value, exports of paper and paper products from the United States this year are running approximately 25 per cent behind shipments last year. judging from returns covering the first three months of the year. The total value of exports during the first quarter of 1933 reached $3,256,501, contrasted with shipments of an aggregate value of $4,261,944 in the same time last year, according to figures compiled by the U. S. Department of Commerce. March exports were valued at $1,193,415, against $1,051,360 in the preceding month, $1,486,131 in March, 1932.

Newsprint exports during March amounted to 5,079,966 pounds of a value of $72,157, showing a big increase over the 600,499 pounds of a value of $15,432 exported in the preceding month. Uncoated book paper exports were 2,020,089 pounds of a value of $96,025 in March, against 832,280 pounds of a value of $49,000 in the same month of 1932, while wrapping paper exports reached a value of $125,098 in March, against $108,212 a year ago, and writing paper exports were valued at $83,254, against $66,406 in March, 1932. Tissue and crepe paper exports declined from a value of $53,445 in March last year to $23,089 in the same month this year, and sheathing and building paper from $19,759 last year to $7,403 this year. Boxboard exports were valued at $37,454 in March and other paperboard shipments at $52,039, contrasted with $28,933 and $78,612, respectively, in the similar month of 1932. Paper bag exports were of a value of $41,820 in March, against $48,716 a year ago, and paper box exports were valued at $40,354, compared with $63,356 last year.



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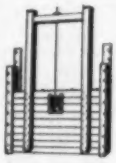

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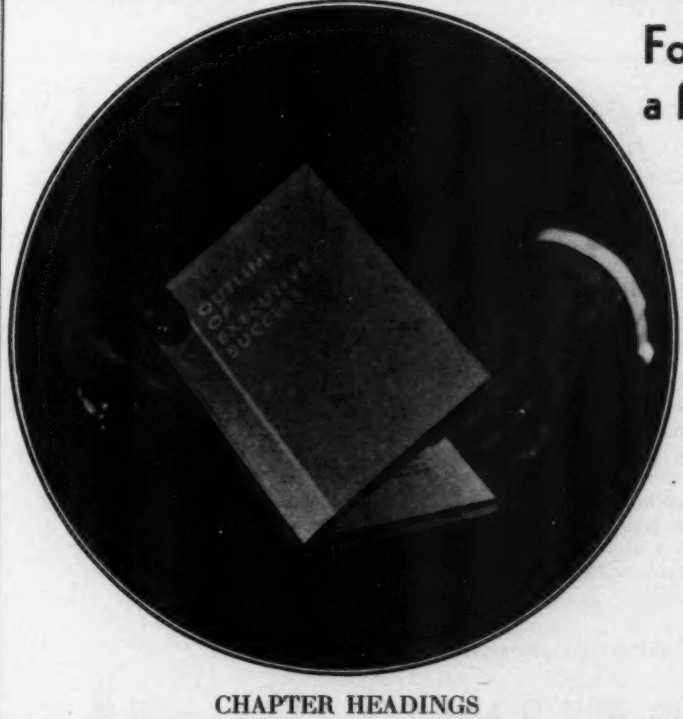

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